Machine and Tool

BLUE BOOK

ESTABLISHED TOUR

DECEMBER 1955

...and on earth peace, good will toward men.

A HITCHCOCK PUBLICATION

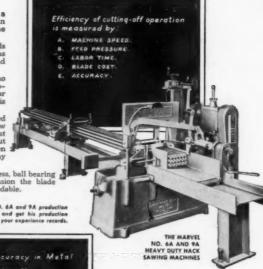
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Efficiency in Cutting-off is Important

Practically all machining operations start with pieces cutoff from bars or billets. Hence, inefficiency, or lack of capacity, in the cut-off department can hold up or stagnate the entire plant.

- A. Are all-ball-bearing and provide a quick return; therefore they run FASTER than others on the same work.
- B. Can apply as much as 1200 pounds feed pressure—two to ten times as much as other hack saws and band gaws.
- C. Are fully automatic, requiring no more operator attention than an automatic screw machine; and set-up for any bar size and cut-off length is extremely simple.
- D. Use a non-breakable high speed hack-saw blade the type of saw blade that produces the greatest number of square inches of metal cut per dollar of blade cost—two to ten times (or more) as much as any band saw.
- Because of their exceptional sturdiness, ball bearing reciprocating frame, ability to tension the blade "truly taut", their accuracy is dependable.

6f you are not using modern, improved MARVEL NO. 6A and 9A production hack sows, call the local MARVEL field Engineer and get his production and cost estimates on your work—to compare with your experience recards.



The composite MARVEL High-Speed-Edge Hack Saw Blade—cuts any machinable material efficiently. There is no time lost changing blades for different types of steel; no time lost replacing shattered blades, because MARVEL High-Speed-Edge Hack Saw Blades are positively unbreakable. These superior blades have the finest high speed steel cutting edge welded to a strong alloy steel body. They will stand-up under the highest speeds and heaviest feeds attainable on any make hack saw. Can be safely tensioned tauter than any other blade—cut-off not only straight but also square and with less stock loss.



Write for catalog C-35—showing and describing eleven different series of Metal-Cutting Sawing Machines and MARYEL-High-Speed-Edge Hock Saw Blades and Hole Saws.



ARMSTRONG-BLUM MFG. CO. 5700 West Bloomingdale Avenue . Chicage 39, U.S.A.

DRILL -

COMMINES

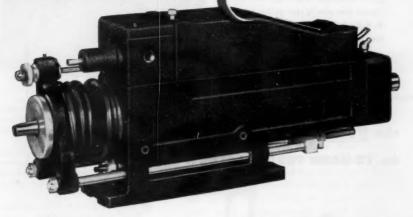
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RAPID ADVANCE

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SPINDLE



Full 3" stroke—any part usable. Takes up to 5/16" drills. Either pulley driven or direct motor drive models available. Compact, stream-

lined, lightweight. Can be mounted at any angle in any plane. Any number of units can be easily synchronized and interlocked for accurately timed sequence operation.

WRITE TODAY FOR BULLETIN BL-5 The Bellows Co. AKRON 9, OHIO In Canada: Pneumatic Devices of Canada, Ltd., Toronto, Ontario

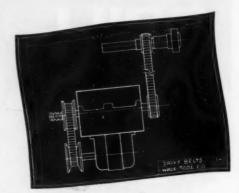
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you can speed up production with this HAND TURRET LATHE

You'll be agreeably surprised at the remarkable increase in your production (and therefore profits) now possible with this modern lathe. Here are a few of the ceasons why:

* Lathe is equipped with a single speed motor which runs in only one direction, the cast iron variable pitch pulleys acting as a flywheel to provide instantaneous reverse and speed changes.

The combination of two belts, as illustrased, with clutches gives a high-low speed change and a fast reverse, insuring num production from this type machine.



the Wade

send for literature

no. 73 HAND TURRET L

Spindle driven by Gilmer steel-cabled timing belt. (Positive drive, cogtooth design - no belt tension required.)

> Variable speed pitch pulley belt connects the motor pulley and the driven pulley on the gear box. Calibrated spring provides correct belt tension,

is 21/2 times the slow speed.



Encircle No. 202 on Card, Opposite Page 65 MACHINE and TOOL BLUE BOOK

AN OUTSTANDING LINE





The Hammond Model CBW-6 Chip Breaker and Diamond Finishing Grinder is a rugged performer in Hammond's outstanding line of Carbide Tool Grinders. More Hammond Carbide Tool, Chip Breaker and Diamond Finishing Grinders are being used today — in more plants than ever before — to grind Carbide and High Speed Tools easily, accurately, better. Hammond offers "America's Most Complete Line" of Carbide Tool Grinders . . . Wet or Dry operation.



MODEL CBW-6 CHIP BREAKER GRINDER





Hammond Machinery Builders

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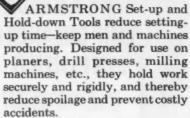
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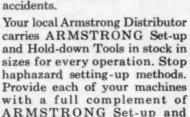
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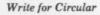
SET-UP
and
HOLD-DOWN
TOOLS



PLANER









T-SLOT CLAM









NON-SKID

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People" 5208 W. Armstrong Ave., Chicago 30, U. S. A.



Hold-down Tools.









T-SLOT BOLTS AND NUTS

STRAP CLAMPS



MACHINE and TOOL BLUE BOOK

DECEMBER, 1955-VOL. 50, No. 12

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MODERN PRESSES BUILT TO OLD STANDARDS OF QUALITY

... such as hand scraping, fitting, inspection and seasoning of castings outdoors to all weather conditions...this gives you PRECISION PUNCH and DIE ALIGNMENT

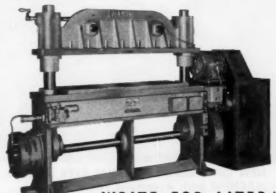
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15 TON BENCH PRESS



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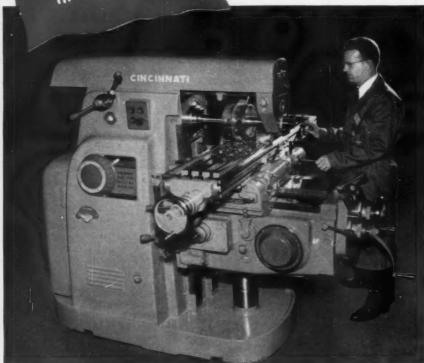
DIAMOND MACHINE TOOL CO.

PICO, CALIFORNIA

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They'll be a Big Hit in Your Shop...

THE NEW



NEW CINCINNATI PLAIN DIAL TYPE MILLING MACHINE with Automatic Table Cycles

CINCINNATI

MILLING MACHINES . CUTTER SHARPENING MACHINES . BROACHING MACHINES . METAL FORMING

CINCINNATI DIAL TYPE MILLING MACHINES

The new Dial Types are bound to make a big hit in your shop... with the operator and foreman... with the methods engineer... with the new equipment analyst.

The new Dial Types are easier and safer than ever before to operate because of their dual push-button controls; complete safety; large speed and feed dials.

The new Dial Types have the capacity to take on more work than ever before... higher ranges of speeds and feeds (up to 90" per minute feed rate); more than 50% increase in power.

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THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO



The New CINCINNATI No. 2 Universal Dial Type Milling Machine

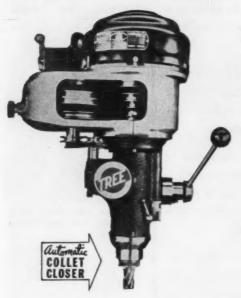


The New CINCINNATI No. 3 Vertical Dial Type Milling Machine



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You can add vertical milling capacity by adapting the versatile TREE MH-4 Vertical Milling Attachment to your present horizontal milling machine. The MH-4 gives you all angle milling, drilling and boring with a high degree of accuracy because of its built-in rigidity. Spindle — alloy steel, hardened and ground Roller drive eliminates back-lash. Quill — 4 inch travel. Enclosed micrometer depth stop. Power feed. Write today for full information.

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TREE TOOL AND DIE WORKS

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RACINE, WISCONSIN

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MACHINE and TOOL BLUE BOOK

The new GRAY Horizontal Boring, Drilling, and Milling Machine is a giant for power, yet so precise it works to minute tolerances. You'll find a rapidly increasing number of these cost-cutting giants in modern shops throughout the world.

GRAY'S high precision, ease of operation, and modern power, will do your jobs better and faster, further proof that

Quality doesn't cost . . . it pays.

The G. A. GRAY CO., Cincinnati, Ohio

GRAY giant

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Southwestern Plant: Dallas, Texas

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Profile
Dressing
Too

Diamond Grit Tools for Thread Dressing

"Tru-Thread"
Thread
Dressi

Thread Dressing Tools

the 20 horsepower miracle

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And, if we needed inspiration and encouragement in our early business years (and sometimes we did) it was right at hand in the social and industrial miracle of one little car that had been launched with an idea just as pioneering as our own.

Until then, horseless carriages had been for the rich. This car was for the common man. It was light, simple, cheap (\$1100 for the Town Car in 1910; \$260 for the Roadster in 1924) and—indomitable. With a spunky little four cylinder, 20 horsepower engine, it performed impossible feats of transportation and endurance.

Orginally, production had been hopefully set at 25,000 cars for the year but in the twenty years of its existence, more than 15,000,000 were built and they changed the pattern of daily life all over the world.

Cars have changed vastly in our time and so have diamond tools, and we have seen our pioneer idea of expertly selected industrial diamonds and Engineered Diamond Tools* become the accepted principle throughout industry simply because they do their job better and at less cost.

*Engineered Diamond Tools means diamond tools engineered to the job and guaranteed to do it.

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416 STAINLESS







SAE 4130

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New cutting oil, Sunicut 5534, is moderately priced . . . gives excellent machining results on wide range of steels

New Sunicut 5534 is a non-emulsifying, transparent cutting oil specially compounded to give above - average machining results to operators who want a single oil to machine a large variety of ferrous metals.

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4130 as well as free-machining stainless steels.

For complete information about new Sunicut 5534 and how it can help you reduce your oil inventories...lower your production costs...see your Sun representative. Or write Sun OIL COMPANY, Phila. 3, Pa., Dept. MT-12.



INDUSTRIAL PRODUCTS DEPARTMENT

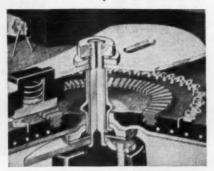
SUN OIL COMPANY, PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

Encircle No. 210 on Card, Opposite Page 65



Ingenious application eliminates hand assembly, makes absolutely uniform stationary contacts in Ward Leonard power rheostats



CROSS SECTION VIEW of a Ward Leonard Vitrohm Type S rhoostat showing how contacts are embedded in a vitreous enamel.

Ward Leonard Electric Co., Mount Vernon, N. Y., makes a line of high quality power rhoostats marketed under the trade-name Vitrohm. Anywhere from 41 to 161 individual stationary contacts, or buttons, have to be embedded with their resistance elements in an insulating vitreous enamelall contacts uniformly set and spaced, for uniform performance. Their patented process originally used buttons blanked out of sheet brass-hand assembled and spaced on a steel wire to hold them while the vitreous enamel was fired.

Ward Leonard refined the process and for four models now starts with the extruded shapes shown above. The stock is accurately slotted for correct spacing, forming a continuous line of buttons connected by a triangular "wire"—which is an integral part of the extruded shape. When sections are curved, the buttons remain uniformly spaced and oriented. After the button assemblies are embedded in the vitreous enamel, the connecting wire is easily milled off. Ward Leonard gets absolute uniformity with less effort and fewer rejects—it gets healthy dollar savings, despite the fact that more than half of the extruded shape is milled out.

Imagination applied to extruded shapes can pay big dividends—lower direct labor costs—fewer machining operations—less scrap—improved product quality. Your Anaconda representative will be glad to work with you. The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

ANACONDA®

Short cuts to a finished product

Encircle No. 211 on Card, Opposite Page 65

CARBIDE CUTTERS

Have you seen what they can do?

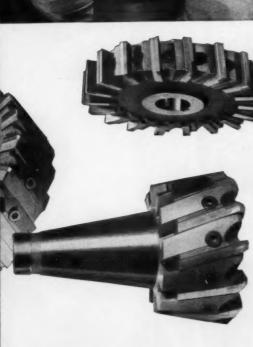
Difficult and unusual operations such as milling the ends of the rolling mill roll shown below help Ingersoll to design carbide cutters for large increases in production.

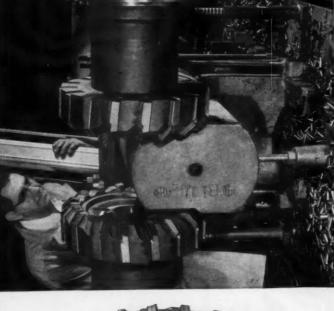
A leader in carbide research, Ingersoll has developed new cutting techniques using improved grades of carbide. Ingersoll inserted blade cutting tools, for all kinds of materials, will give you increased feed rates and longer blade life. Our cutter engineers are available to show you how Ingersoll carbide cutters can multiply production on your particular milling and boring machines.











WRITE FOR CATALOG 66E

Write for Cutter Catalog 66E, describing Ingersoll inserted blade face mills, end mills, helical slab mills, side mills, arbor cutters and boring heads.

Builders of special design milling & boring machines originators of $\frac{SHERR}{CILRRS}$ cutters

DNGERSOLL

CKTORD, ILLINOIS, U. S. A.

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This year...
let us open our hearts
and homes to the
Brightest Gift of All...

The True Spirit
of
CHRISTMAS

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Fastest, most accurate and simplest method of lead screw tapping yet devised! Utilizes instantaneous-acting forward and reverse electromagnetic clutches to make tapping easy and automatic. Check these features:

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- No reversing motor required electromagnetic clutches control tap direction.
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- 4. Thread depth control to within 1/4 turn of tap.
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The A.T.U. No. 3 Lead Screw Tapping Unit can be incorporated into a limitless variety of tapping setups using Ettco-Emrick fixed or adjustable spindle multiple heads, work holding fixtures, etc.



Bulletin No. A.T.U. has details. Send for a copy.

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Chicago • Detroit • Menlo Park, Calif. • Worcester Distributors throughout the U.S. and Canada

A. T. U. No. 3 Lead Screw Tapping Unit with Ettco-Emrick multiple tapping head.

The ultimate in tapping speed and economy, A.T.U. No. 3 Lead Screw Tapping Machine

with Ettco-Emrick multiple

spindle head and work hold-

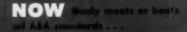
ing fixture.

TAPPING ATTACHMENTS . MULTIPLE HEADS . TAPPING MACHINES . INDEXING FIXTURES . TAP AND DRILL CHUCKS

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design freedom

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DIE SETS AND DIEMAKERS' SUPPLIES DANLY MACHINE SPECIALTIES, INC. 2100 South Laramis Avenue, Chicago 50, Illinois

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The New slot-free ram also eliminates the manual clamping of ram adjustment—a time saving feature.

A speedy, dependable electro-magnetic brake and clutch insure a faster performance.

50 P.S.I. pressure lubrication, exclusive on Cincinnati Shapers, is a real insurance against wear and a guarantee of long trouble-free performance.

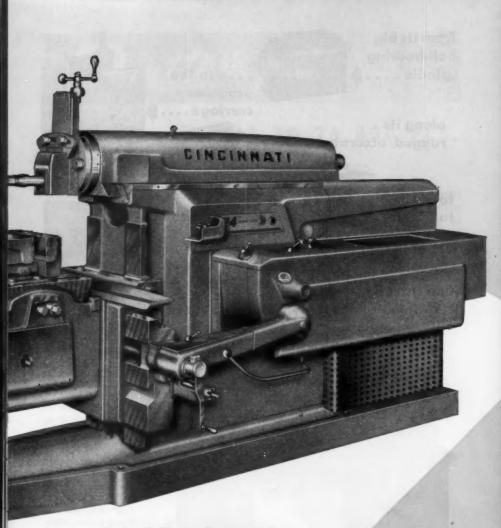
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Modular iron, slot-free ram

Electro-magnetic Clutch and Brake

The only shaper with 50 P.S.I. lubrication

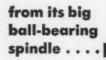


Cincinnati Shapers, Shears and Press Brakes carry a 5 year guarantee on workmanship and material-write for details.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS . SHEARS . BRAKES





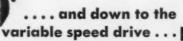


.... to the precision carriage...



along its rugged, accurate bed . .







and its solid, strong, convenient cabinet



... the No. 6560 Logan 14" Lathe is

ruggedly proportioned, precision built and dynamically balanced. Its superiority is evident as it hogs the heavy cuts with almost no perceptible vibration, and pro-

duces precision results in production, maintenance and tool room operations.

At your Logan dealer's.

Write for Bulletin 14-L.



14%" swing over bed 9" swing over saddle 1%' spindle hole 1" collet capacity 40" between centers Variable Speed Drive Ball Bearing Spindle 38 to 1200 rpm

LOGAN ENGINEERING CO.

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CHICAGO 30, ILLINOIS

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MACHINE and TOOL BLUE BOOK

Inutton

THREAD ROLLING MACHINERY

SHEET METAL SCREWS



UP TO 25,000 PCS. PER HOUR!...

Prutton Exclusive Planetary Dies and Thread Rolling Machines are setting new records in regular production of wood and sheet metal screws. The special designed dies are in sections inserted in a planetary holder; easily and economically replaced in case of excessive wear of any part.

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In addition to Type A and Type B Sheet Metal Screws (at a maximum capacity of No. 12 diameter by 2" thread length), Prutton Thread Rolling Machines also produce Wood Screws and Twinfast Wood Screws at record breaking production rates.

Boost your production! Increase your profits! Submit your parts for our recommendations. No obligation, whatseever.



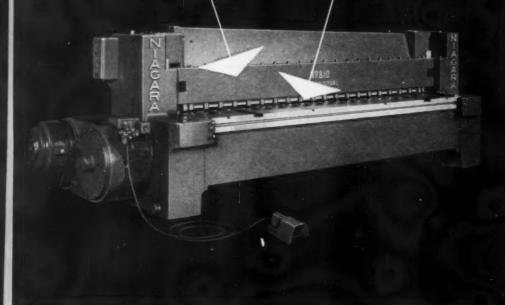
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CLEVELAND 30, OHIO

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SELF-COMPENSATING HOLDDOWN



America's most complete line of presses, shears, machines and tools for plate and sheet metal work

a BIG FACTOR in the superiority of Niagara Shears



Positive, power actuation grips work securely for maximum cutting accuracy.

LOW IMPACT AVERTS DAMAGE AND INACCURACY

Individual pressure feet contact work with low impact, thus safeguarding both the material and bed against damage, as well as reducing noise level. No hammer-blows to mar work. No peening of bed with resulting distortion of knife seat.

SIMPLIFIED, LOW UPKEEP DESIGN

Simplicity of design and construction, involving a minimum number of parts, assures negligible servicing. With *less* to go wrong, there is *less* to repair and replace.

HOLDS WORK FLAT AND STATIONARY

Multiple pressure feet on 6" centers, applying uniform pressure, hold work flat and tight against bed to assure utmost shearing accuracy. No rippling of sheet between feet as cut progresses. Firm grip on short pieces.

HANDLES STOCK OF VARYING THICKNESS

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In a power squaring shear, no single feature nor component can be fully responsible for accuracy, speed and economy. They result from a combination of features such as the self-compensating holddown; rigid, fully closed box section construction of bed and crosshead; low slope of upper knife; ample and accurately held crosshead guides; multiple point sleeve clutch—the very features that have established the marked superiority of Niagara's Underdrive Series.

For the whole story, straightforwardly presented, on America's most complete

line of underdrive power squaring shears, with capacities from shim stock to 1 in. thick mild steel (lengths 3 to 20 ft.), request Niagara Bulletin 69. Write today,





UNDERDRIVE SQUARING SHEARS

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CUT 50%

New Rotor **D-4S** Air Grinder pays for itself in 12 weeks

Job: Grinding defects in holes of castings with cone wheel (size 2¾" x 3½" x ¾"). Formerly used 3600 rpm electric grinder (3 phase, 220v.). Job took 8 minutes—too slow.

Solution: Rotor Application Engineer suggested changing to Rotor D-4S Cone Grinder—speed 8500 rpm.

Results: Saves 4 minutes per casting; doubles output. With 50% use factor, savings paid for new Rotor Grinder in 12 weeks. Wheels last longer. Tool is lighter (only 8¼ lbs.); easier to handle. No tool stalling—even when crowded in hole.

Get the Rotor Engineer on your portable tool jobs to save you money!



APPLICATION

Rotor D-4 Air Grinders are available with straight or grip handle at 8500 rpm for cone wheels and 4" elastic wheels and at 6000 rpm for cone wheels, 6" elastic wheels and 4" vitrified wheels.

ASK FOR BULLETIN 43

THE ROTOR TOOL CO.

CLEVELAND OHIO

Encircle No. 220 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK



Holes, Contours, Surfaces

Published in the interests of greater accuracy and quality in the toolroom and on the production line by the Moore Special Tool Co., Inc., 728 Union Ave., Bridgeport 7, Conn., builders of Jig Borers, Jig Grinders, Panto-Crush Wheel Dressers, Precision Rotary Tables, Motorized Centers and a complete line of Hole Location Accessories.

New 424-page Book Tells How You Can Produce Tools, Dies, Precision Parts the Modern Way

"Holes, Contours and Surfaces" Just Published

"Holes, Contours and Surfaces," just published by Moore, gives all the answers to metalworking's toughest problem: the accurate locating and machining of holes, contours and surfaces. It covers the many major developments in the field since 1946 when Moore's first book, "Precision Hole Location," was published. That book became a technical best-seller and is now out of print.

While "PHL" dealt only with jig boring and jig grinding of holes, this new, 424-page volume describes subsequent hole-location developments, covers contours and surfaces, and introduces the subject of linear form grinding. "HC&S" is a must for every toolmaker, jig borer operator, jig grinder operator, machinist, tool engineer, production engineer, machine buyer, machine builder, production executive, product designer, apprentice and student.

ONLY \$5 in U.S.A., \$6 Elsewhere

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"HC&S Fills Urgent Need" ...Burnham Finney

Burnham Finney, editor of American Machinist, says: "HC&S is outstanding for its clarity of expression, its technical accuracy...fills an urgent need."

EXCLUSIVE—184 Pages of Woodworth Tables

"HC&S" includes a 184-page section of Woodworth Circular Tables which greatly simplify calculating rectangular coordinates for locating hole centers on a circular layout. There is a table for each pattern of holes, 3 to 100 inclusive. These tables are not available elsewhere.

495 Photos and Drawings

"Holes, Contours and Surfaces" features a multitude of close-up instructional photographs, working drawings and charts placed adjacent to text so that it can be followed photographically.



Moore Special Tool Company, Inc.
728 Union Avenue, Bridgeport 7, Connecticut

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STABILIZE ALLOY STEELS by complete change of austenite to martensite...

TOUGHEN METALS, increase hardness and life of perishable tools up to 400%

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the Way to LIFE FOR YOUR DRILLS

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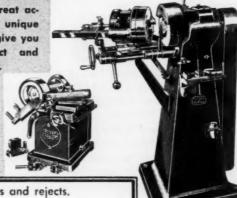
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Twist drills machine-ground the Oliver Way not only last up to 3 times longer than hand-ground drills but also cut faster and more accurately.

OLIVER DRILL POINTERS are so efficient that they grind uniformly all drills

to a perfect balance—each lip of the drill doing equal work. This great accomplishment is due to a unique OLIVER feature—the ability to give you the only scientifically correct and theoretically perfect drill point.

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AUTOMATIC DRILL GRINDERS TOOL & CUTTER GRINDERS DRILL POINT THINNERS TEMPLATE TOOL GRINDERS FACE MILL GRINDERS DIE MAKING MACHINES

Encircle No. 399 on Card, Opposite Page 65

for Single or Multiple PRECISION TAPPING

on your

SPECIAL MACHINES

The WISCONSIN Model TU-415 Automatic Lead Screw Tapping Unit is a completely self-contained assembly designed especially for precision work on your special machines.

It may be mounted in any position and is permanently sealed against coolant entry.

Safety Features provide positive protection against spindle over-travel and tap end-thrust.

Setting up and Re-setting is done easily and quickly. Versatility is assured by ready changeability of spindle speed, spindle travel and thread pitch.

Controls are built in. A reversing motor controller and initiating switch or push button operate the unit. No relays are required.

Precision Construction permits precision tapping on a production basis. Simplicity of design assures ease of maintenance, accessibility of all parts.

Write for Illustrated Bulletin





For Single Spindle Tapping, the TU-415 is furnished without quill flange and with ASA 1" bore, adjustable adapter spindle.



For Multiple Spindle Tapping, standard equipment includes flanged quill and slotted spindles for close-coupled multiple spindle tapping heads.



WISCONSIN DRILL HEAD CO.

4981 N. 124th STREET

BUTLER, WISCONSIN

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MACHINE and TOOL BLUE BOOK

A SHORT CUT TO A FINISHED PRODUCT



SAVE YOURSELF TIME AND TOOL CHARGES

with Anaconda multiple-plunger press products—in a wide choice of metals

If you need parts like these in quantity, The American Brass Company can save you time and money. Through its specialized experience—and thousands of stock tools—it may save tool charges, too.

Ferrules, grommets, eyelets, deepdrawn cups and shells, and thousands of other intricate, close-tolerance parts made from strip metal are everyday business. American Brass Company design engineers and toolmakers have earned an enviable reputation for cutting costs and performing the almost impossible in design and production.

Your choice of metal: Such fabricated products can be furnished in copper, brass, bronze, nickel silver, nickel, iron, steel, stainless steel, and aluminum — in a wide variety of finishes.

Standard products: For a selection of more than 1000 eyelets of common sizes and styles, as well as eyelets kept in stock for immediate shipment, write for Catalog BG-1.

Special products: Just send a sample, drawing, or description, together with the quantity you need, the metal to be used, and other pertinent information. Address: The American Brass Company, Waterbury Brass Goods Division, Waterbury Brass Goods Division, Waterbury 20, Conn.

ANACONDA MULTIPLE-PLUNGER PRESS PRODUCTS

Encircle No. 225 on Card, Opposite Page 65

Up to 40% higher tightening torque— tightening torque— a new Unbrako feature

RECOMMENDED SOCKET SET SCREW TIGHTENING TORQUES (Inch-Pounds)

(inch-roomas)			91	MINIMUM
CREW SIZE	UNBRAKO	SET SCREW	SET SCREW	DIFFERENTIAL %
#4	5	3.9	3.5	28
#5	9	7.8	7.4	15
#6	9	7.8	7.4	15
#8	20	14.7	14.5	36
#10	33	26.5	25	25
1/4	87	62	60	40
5/16	165	122	125	32
3/8	290	198	225	29
7/16	430	309	350	23
1/2	620	460	500	24
5/8	1225	1106	1060	11
3/4	2125	1540	1800	18
7/8	5000	3660	4600	9
1	7000	5025	6500	8

ALL UNBRAKOS can withstand higher tightening torques than ordinary socket set screws. For example, the recommended torque for a \(\frac{1}{4}'' \) UNBRAKO is 87 inch-pounds—40% greater than that recommended for an ordinary socket set screw.

Set them, forget them—they stay tight New high-torque Unbrako self-locking socket set screws

Research has proved that the tighter you seat a set screw the better it works. So we designed a set screw that can be tightened tighter than ever before. We formed a deeper socket. We put a radius in the socket corner. We developed fully formed threads. We established new methods of heat treatment in atmosphere-controlled furnaces. All this, plus the well-known self-locking knurled cup point that keeps it tight.

Let's see what the changes in the UNBRAKO socket mean to you. The deeper socket gives you more purchase with the wrench. Since more wrench can be put in the socket, you can tighten the screw much tighter. And you won't ream the socket or round the corners of the wrench. The radius in the UNBRAKO corners eliminates the sharp corners where cracks start. Ordinary socket screws have sharp corners which often crack even at the lower recommended torques.

You can't buy a better set screw than an UNBRAKO. See your authorized industrial distributor today. Or write STANDARD PRESSED STEEL Co., Jenkintown 52, Pa.

Unbrako Set Screw

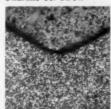


Ordinary Set Screw

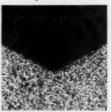


COMPARE the socket depth. The UNBRAKO socket at the left is much deeper than the socket in the ordinary set screw at the right. This additional depth in the UNBRAKO socket gives you more purchase with the wrench—you can set an UNBRAKO much tighter.

Unbrako Set Screw



Ordinary Set Screw



THE RADIUS put in UNBRAKO socket corners eliminates the sharp corners where cracks start. They distribute the stresses developed when tightening torques are applied. You can seat an UNBRAKO tighter without screw failure. Ordinary set screws have sharp corners which often crack when tightened even at lower recommended torques.

UNBRAKO SOCKET SCREW DIVISION



• V & O long slide presses provide the precision essential to modern tooling. The true travel of the V & O long slide assures accurate registration of punches and dies, more efficient operation of tools and attachments. For press production that pays off in longer tool life and better work quality, make sure it's a V & O.

LENGTH means LIFE

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With the same running clearance, the longer the slide the less possibility for angular misalignment.

And we keep our running clearances extremely close.



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Automatic opening tangent stationary and revolving types, radial stationary type, B&S and small turnet lathe types



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J&L Automatic Opening Die Heads and Chasers assure: low initial cost — ease of operation — controlled resharpening — use of carbide where applicable. Class III threads guaranteed. This means important savings regardless of your tolerance requirements. Write to Dept. 710 for complete information.

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THREAD TOOL DIV.

Encircle No. 228 on Card, Opposite Page 65

December, 1955

37

ebastian 13" A-5 GEARED HEAD PRECISION LATHE -



Speed changes easily made by revolving speed dial on headstock



Heavy, multiple Splined Spindle with "Zero Preci-sion" tapered roller bearings



Quick change Gear bex pro-vides 60 different threads or feeds - has built-in lead screw reverse



Massive 1-piece, double walled apron with gears running in oil has "1-shot" pressure lubrication system for carriage and ways



make for money-saving production . . . with all controls centrally grouped in easy reach for safe efficient operation.

Modern, heavy cast-iron pedestal (included in base price of lathe) completely encloses motor and drive . . . with storage space in tailstock leg for tools and chucks.



Cam action tailstock clamp permits rapid re-lease and instant lockof tailstock

Run this new Sebastian lathe. Test its performance. You will appreciate the powerful cuts that this lathe can take. Write for circulars on 13" and 15" Sebastian lathes and name of nearest dealer where you can see and operate these outstanding lathes.

4202 N. Knox Ave., Chicago 41, Illinois

Encircle No. 229 on Card, Opposite Page 65 MACHINE and TOOL BLUE BOOK For automatic production

best choice is CIRCLE R

For fast production, especially where extra tough cutting prevails, Circle R Carbide Saws are indicated. In an automatic production layout, where precision performance is indispensable, they are the best you can buy — yet they cost no more. Our expanded and inclusive line—both carbide tipped and solid tungsten carbide — is designed to fully meet your needs.

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CIRCULAR TOOL CO., INC.

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Specialists in Circular Cutting Tools Since 1923

METAL SLITTING SAWS COPPER SLITTING SAWS SCREW SLOTTING SAWS COMMUTATOR SLOTTING SAWS FUNCES SAWS SUT OFF SAWS CUT OFF SAWS CUT OFF SAWS CUT OFF SAWS CORD SAWS CORD SAWS CORD SAWS CORD CORD TO STEEL SAWS SOLID & TIPPED TUNGSTEN CARRIDE SAWS COMBINED DRILLS & CONTERSINKS CENTER REAMERS

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wiping cost you last month?

Switch to Scott Wipers—eliminate expensive handling, controls and lost production time... get more efficiency!

Add up your wiping costs for last month. What did you spend to count, sort, bale and launder wiping material? How much efficiency did you lose in distribution . . . in housekeeping . . . in production time?

New Scott Wipers—the strong, capable disposable wipers—put an end to all these inefficiencies, all these high-cost "extras." But try the Scott Wiper yourself. Ask your local Scott salesman or distributor to help you set up a 90-day trial installation in your plant.

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MAKERS OF HAND AND POWER HACKSAW BLADES, FRAMES, AND METAL AND WOOD CUTTING BAND SAW BLADES

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MACHINE and TOOL BLUE BOOK

(A) 1890

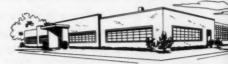


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A SIZE AND STYLE FOR EVERY
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THE GISHOLT ROUND TABLE

represents the collective experience of specialists in the machining, surface-finishing and halancing of round and partly round parts. Your problems are welcomed here.

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Horizontal Swivel Type

MULTI-PURPOSE WONDER GRIP VISES

4 STEPPED JAWS PERMIT CLAMPING of rough castings, irregularly shaped, round, and tapered pieces accurately and quickly, eliminating need for special jigs or fixtures. Narrow stepped jaws allow free access to and measuring of work pieces and provide clearance for cutting tools. Small work pieces machined on three sides without reclamping, Easy and quick to mount and align on any machine. Holds rigid in any position without vibration. Various capacities and extra soft jaws available.



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You'll discover new versatility for milling intricate jig and fixture work, for keywaying, slotting and angular milling. Two graduated swivels permit mounting the spindle head in almost any angle for milling, drilling, spot facing and related operations.

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J. A. FAY & EGAN COMPANY
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- Swivels permit any angular setting of spindle head.
- 2 HP Independent motor drive.
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- · Quill has 4" hand feed,
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- Full vision oil level gauge.

RACK FEED. The overarm is equipped with rack feed for positioning over work.

Manufacturers of GREAVES MILLS "the MOST Mill for the LEAST Money!"

THE

SELLERS 6-GA

DRILL GRINDER





Grinds faster and handles easier. And it can also be

arranged to grind carbide drills.

Capacity: 5/16" to 3" drills

CONSOLIDATED MACHINE TOOL CO.



ROCHESTER, NEW YORK

DIVISION OF FARREL-BIRMINGHAM CO., INC.



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HIGH SPEED LATHE

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An outstanding example of Swedish precision craftsmanship. The S8S is only one of the great variety of Koping's lathes now available.

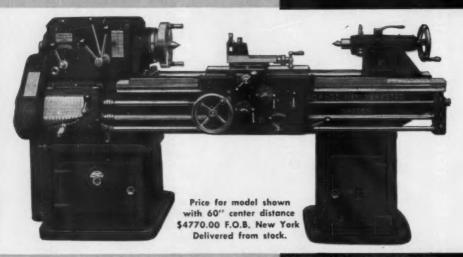
Write, outlining your needs, for complete details on the Koping lathe for your particular requirements.

SPECIFICATIONS

Swing over bed	161/2
Spindle speeds, number	18
Spindle speeds in geometric progression 12.5	-1000 r.p.m.
Thread pitches per inch threads, number	50
Threads per inch, range	2-68
Thread pitches for millimeter threads, number	7 26
Millimeter pitch, range	0.5-15
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Extra equipment available

Cooling systems Cutting speed selector Load indicator Special tool posts Turrets Relieving attachments Taper turning and profiling attachments Feed stops, etc.



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The Buck is the original precision scroll chuck, and the 6-jaw design was truly revolutionary.

It has been so successful others have copied its appearance and attempted to copy its performance. As might be expected the

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It means that 6 jaws are no longer the distinguishing hallmark of the Buck. You have to look twice, when you buy, to make sure you are getting a Buck to get the maximum savings in costly machinists' time plus the construction that guarantees long accurate service. Your Buck distributor will gladly point out the Buck advantages. Catalog gladly sent on request.

How To Make Sure It's A Buck Chuck

Most Buck chucks carry a nameplate reading "Ajust-Tru." An even more distinguishing feature are the 12 cap screws that hold the chuck and the chuck adapter together. These 12 large screws are also an indication of the durable, rugged construction of the Buck. Keep them in mind when you buy.

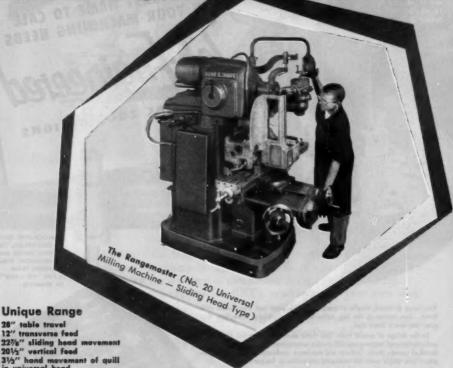
Buck chucks come in 6, 3, and 2 jaws—adaptable to lathes, grinders, dividing heads, and screw machines. Sizes from 4" to 9".

BUCK TOOL COMPANY

1212 SCHIPPERS LANE . KALAMAZOO, MICH.

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Fond de Lac, Wisconsin

BORING TOOL DIVISION of



spot the champ

the champion's always REX

Compare the freckles and you'll pick the champ. And it's easy to spot the champ in high speed steels, too, for Crucible REX® has been the *standard of comparison* for over half a century.

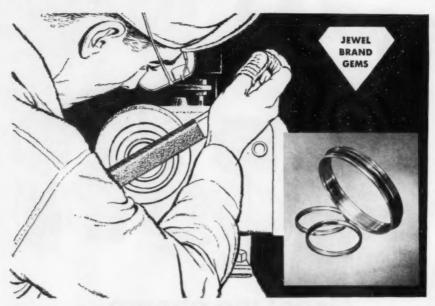
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CRUCIBLE

first name in special purpose steels

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Putting the <u>finishing touch</u> on new developments at Pawtucket Spinning Ring Co.

To meet the requirements of modern high speed spinning, striking improvements involving advanced manufacturing methods have been made in the spinning and twisting rings of the Pawtucket Spinning Ring Company of Pawtucket, R. I. With it all, Jewel Brand Abrasives continue to be used for applying the finishing touch. They produce economically a shiny-smooth surface on the ring faces in keeping with the high calibre of craftsmanship required for precision-finished sections. At the Pawtucket Spinning Ring Company, Jewel Brand Abrasives have

been specified for this purpose over a period of 16 years.

Maintenance of uniformly high quality standards often figures in favor of Jewel Brand Abrasives. Combine this advantage with their longer wear, plus faster, cleaner cutting action, and you have the reason why cost-wise manufacturers turn to Jewel Brand first for finer finishing. You can check these advantages so easily. Call your nearby Jewel Brand Abrasive Engineer or Industrial Distributor, or write direct to Abrasive Products, Inc., 527 Pearl St., South Braintree 85, Mass.







Why GISHOLT BALANCING stresses "plane separation"

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Gisholt Balancers provide plane separation by means of electrical networks. They enable you to use whatever correction planes are most convenient on your specific parts. They are capable of measuring vibratory movement of at least .000025 inch. Gisholts are faster, easier to operate, easier to read.

And they make it easy for you to be sure.

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GISHOLT

Madison 10, Wisconsin



PAY-AS-YOU-PRODUCE PLAN Aunouncing MIN. WALES Fabricators

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A part of FARM EQUIPMENT, 72-1/2' x 22' with 32 holes and nibbled cut out was finished in-2.32 minutes. cluding setup in only 12.01 minutes, subsequent pieces in

AN AIRCRAFT part 7-1/2" x 4-1/2" with 15 holes and 1 norch was produced including setup in only 3-52 minutes and subsequent pieces in only

37 seconds.

Partofan ELECTRIC REFRIGER.
ATOR, 39-7/8" x 8-1/2" with 10
holes and 4 notoches was fabricated
holes and 4 notoches was fabricated
including setup in only 5.61 minutes and subsequent pieces in only

54 seconds.

stounding time studies produced on the difference between your present meth-

VALES-STRIPPIT CORPORATION

MAGNETIC **CHUCKS**

Grip Work Cightly

for Wet or Dry Grinding

Guaranteed waterproof. Connections for either 110 or 220 volts D. C.

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53/4" x 13"

5 63.00

61/2" x 18"

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8" x 24" 103/4" x 37" \$156.00 \$296,00



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Instantly demagnetize tools or production parts. No moving parts. 110 volt, 60 cy. A. C.



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ROUND TYPE 33/4" opening

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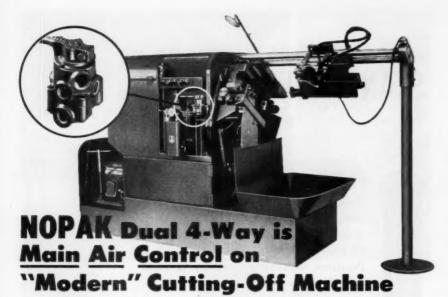






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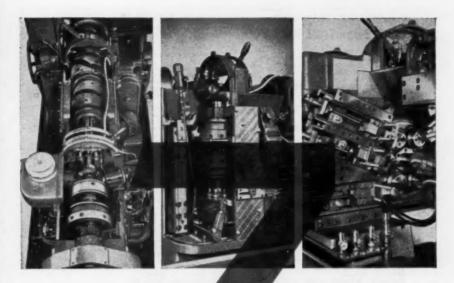
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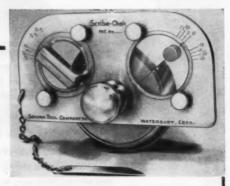
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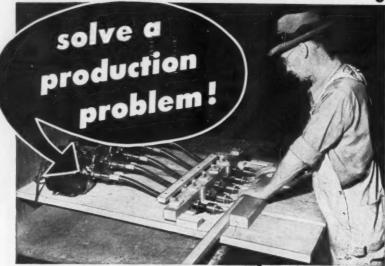
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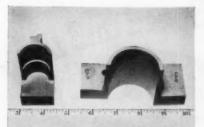
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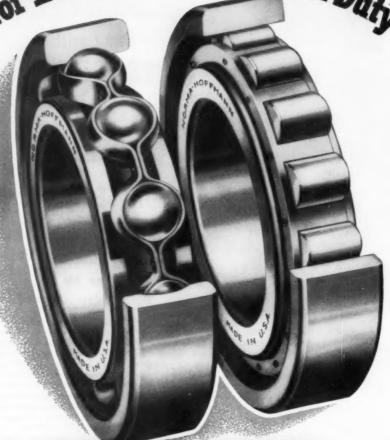
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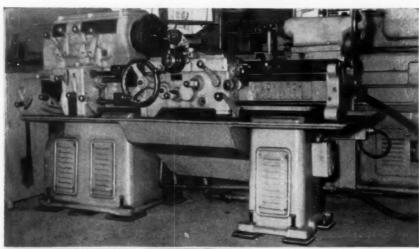
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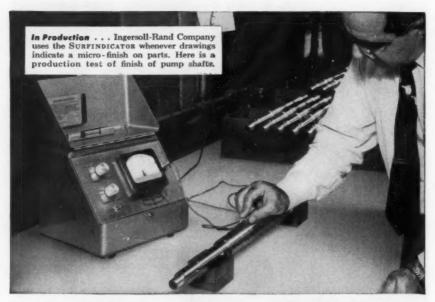
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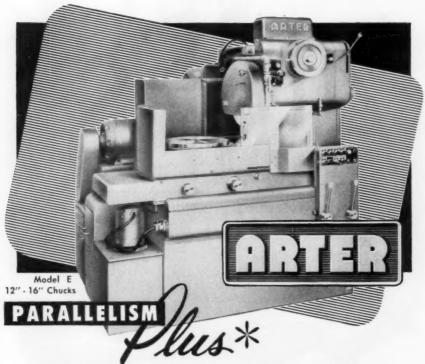


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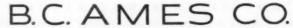


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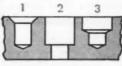
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UNIVERSAL TOOL BLOCK

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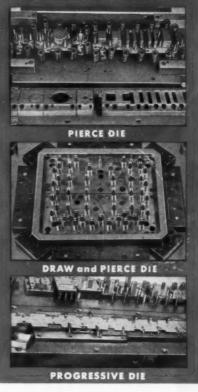
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MACHINE and TOOL BLUE BOOK

Featured in this issue

Comprehensive Tool Control Systems Acts as a Nerve Center of Plant	
Quality Control of Jet Engine "Hot Parts" Drops Rejection	
Rate to Zero	114
Follow Good Die Making Practice and Precise Workmanship	126

Comprehensive Tool Control System Acts as Nerve Center of Plant, by T. F. Dundon, superintendent, Carrier Corp., Syracuse, N.Y. The author outlines a model tool control system setup by his company. This system covers control inventory, quality control, theft prevention, economical maintenance and a program of increased employee responsibility. Page 99

Machining Eliminated by Die Casting One-Piece Aluminum Compressor. A lightweight compressor has been made possible by die casting the double cylinder compressor housing of aluminum. The compressor, a part of an air conditioning unit, is a complex unit, allowing virtually no dimensional tolerances. Continuous testing for more than 70,000 hours revealed undiminished results.

Machining Time Reduced From 2½ Hours to 14 Minutes With Use of Gang Turning Tools. by Tom Brown, Consulting engineer. Mr. Brown gives a good example where a problem tackled in the proper light can be easily overcome. He deals with a manufacturer's problem of trying to find a more economical method of producing flat belt pulleys. The solution is interesting and applicable in many cases. Page 106

A Faster, Less Expensive Cutting Tool Passes First Hurdle. This new Norton Alundum ceramic tool is reported to cut at speeds three times faster than normal while providing "excellent" finishes. Page 110

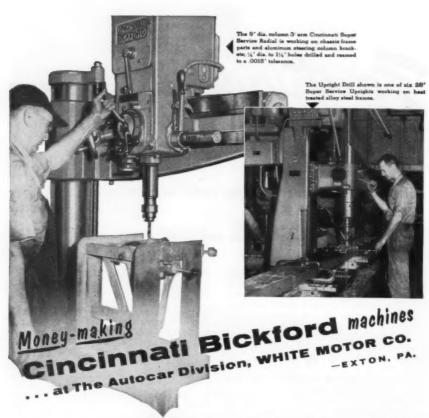
Quality Control of Jet Engine "Hot Parts"

Drops Rejection Rate to Zero, by George
Hugo, vice-president and plant superintendent, Portland Copper & Tank Works,
Inc., Portland, Me. Mr. Hugo relates how
quality control and efficiency in the welding department eliminated rejections by
introducing sample tests for every single
welded component in the fabrication.

Page 114

Follow Good Die Making Practice and Precise Workmanship, by Paul Prikos, vice-president, Prikos & Becker Tool Co., Skokie, Ill. The author deals with shaving dies. He says there are no short cuts in building them, and that they must be built according to the general design. He gives a step by step outline of the problems and solutions. Page

"Hidden" Arc Welding Slashes Cost 40% in Steel Chest Production. Diebold, Inc., of Canton, O., have made changes to their welding techniques which have resulted in over-all savings of more than 40%. This new welded design requires less machining and finishing, and eliminates costly, time-consuming removal of small casting cracks and inclusions on the highly polished surface. Page 132



Photos courtesy the Autocar Division of The White Motos Company, Exton, Pennsylvania Speed and easy handling—power and accurate, steady performance were factors in the selection of Cincinnati Bickford Super Service Radial and Upright Drills in this plant. They are quickly adaptable to a variety of operations, including drilling, reaming, tapping and trepanning.

For rapid, accurate, dependable production investigate these cost reducing modern drilling machines.

Write for Bulletin R21C.





RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

Subsidiary of GIDDINGS & LEWIS MACHINE TOOL CO. 1 Fond Da Lac, Wisconsin,

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AS THE Editor SEES IT

Our Critical Skilled Labor Situation

OUR country is faced with a shortage of skilled labor. A recent Department of Labor report claims we have only nine million skilled workers in a labor force of 65 million, insufficient "to meet the needs of military and civilian production."

Today the government, through its apprentice training program is battling mighty odds to meet the situation. The hands of business are too often tied by the unions and too often tied by their unwillingness to train apprentices. The unions say they encourage apprentice training, business is loud in crying, me too. Yet, our working force of skilled craftsmen continues to decline.

Today's young men aren't entirely blameless. They'd rather be unskilled at a high wage than be apprenticed at a low starting wage. Too many young men are big money conscious before they have the skill to command big money. Also, the young man sees little economic advantage to being a skilled worker who receives only 30% more than his unskilled coworker. During the 30's a skilled craftsman commanded 80% more pay than the ordinary laborer; today he receives only 30% more.

The unions, in encouraging industrywide bargaining become the mighty levelers. The weak, in the majority and controlling voting power, have been lifted; the majority, composed of skilled workers have been cut back, relatively speaking. The strong are held back, the weak are advanced. Cut the top, encourage the underbrush! We know this type of thinking from previous Democratic administrations.

That the skilled workers are unhappy is proved by the formation of a Society of Skilled Tradesmen. Their grievances are: unions tend to encourage flat wage increases instead of percentage increase; contract negotiations tend to favor the unskilled over the skilled worker. Bluntly, they don't think they're getting a fair shake.

It would appear that only drastic measures will train skilled workers: make the wage difference between skilled and unskilled labor such that it becomes an aim of a young man to want to become skilled; provide wages and tax incentives for the apprentice; business must train a certain number of men for skilled crafts in direct ratio to its labor force; substitute percentage contract negotiations instead of flat increase negotiation; unions must loosen training rules or not be permitted to exercise any control over apprentices; a higher wage scale for both apprentices and skilled workmen.

> Wm. F. Schleicher Editor



"Now we can handle more and bigger jobs"

The experience of
Michigan Machine and Tool
Co. duplicates that of
many other custom die
shops who have installed a
Dake Die Try-Out Press

Michigan Machine & Tool Co. of Grand Rapids earned an enviable reputation as diemakers for a number of important manufacturers, but they were limited to building smaller size dies for lack of try-out facilities.

"We found it quite impractical," they said, "to interrupt a customer's production while we tried out a die on his press." Since installing a Dake Die Try-Out Press, Michigan Machine & Tool Co. is being commissioned to make more dies, and bigger dies . . . bringing a substantial increase in business and correspondingly in profits.

Information on Dake Die Try-Out Presses is contained in Bulletin No. 330 . . . send for a free copy today.

DAKE CORPORATION, 608 Seventh St., Grand Haven, Mich.















Encircle No. 280 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK



L very truly!

Letters to the Editor

Davis Interview

The interview with D. J. Davis of Ford in your October Machine & Tool Blue Book reveals some high-level thinking on the behalf of a very progressive manufacturer. I was interested in Ford's replacement program, which Mr. Davis explained briefly. It is too bad that more space was not devoted to this most important of subjects. Mr. Davis states that his company is endeavoring to promote standardization of components of straight-in-line machines, components such as main base, side wing base, transfer mechanism and power units. I think this is the answer to a problem now confronting a great many manufacturers. Too many of them purchase special machines for a special job without realizing that once the job is completed there is little chance of the machine being changed over to another job without incurring considerable cost. Otherwise the machine lies around unused, cluttering up costly space.

I concur with Mr. Davis that standardization of high production machine tools will substantially lower cost and will lower considerably the amount of time involved in change-over.

Your interview series is interesting and, as a reader, keeps me alert to what the top manufacturing executives are thinking.

Willis R. Pickens, Consulting Engineer New York City

Machine Tool Show

Have enjoyed reading your magazine for many years, and was especially pleased to receive your November issue in which you featured the machines and operations at the Chicago tool show. As I was unable to take the time necessary to jot down many of the operations being performed, I was happy to see your magazine has made a record of many of them. I think you have selected the most interesting of them and have done a worthwhile service for your readers.

It is always interesting to learn how the other fellow does a job, and I am constantly watching for new methods and new machines in the machine books.

The machine builders have come a long

PERFECTION There is a discovered to the state of the stat

There is a difference between Chicago-Latrobe Reamers and others you can buy. Sometimes you

can't see this difference—or even measure it with a micrometer. But when you put these tools to work on your production jobs, their finer qualities become something you can measure in the dollars and cents of extra production. Finer, basic materials and finer treatment of these materials form the basis of this extra performance. And beyond this is an unmatched experience in fine tool-making. When you try them you'll see the difference.

CHICAGO-LATROBE

SERVICE THAT'S DOUBLE-BARRELLED

Chicago-Latrobe service means two things to you:

1. Dependable, on-time delivery from the most complete line of cutting tools, and, 2. Skilled help on tough problems from your Distributor and Chicago-Latrobe's own Service Engineers.



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- DRILLS COUNTERSINKS
 - · CARBIDE TOOLS
 - * REAMERS
 - COUNTERBORES
 - . SPECIAL TOOLS

Encircle No. 281 on Card, Opposite Page 65

way in the past 10 years in building automatic machines which increase production at lower costs. I think this is a very healthy sign for American industry. I was also surprised to see at the show the advances in automatic and tape controlled machines. However, many of them were too complicated to understand in the few days I was able to spend there.

I would like to extend an invitation to you to visit our shop and see at first hand some of the machining operations. I think you will find them of consider-

able interest.

Raymond Rock, Shop Supt. Detroit, Mich.

Information, Please

I am interested in going into the brass forging business and would like to acquire more information on all phases of it.

I would appreciate it very much if you would inform me as to any books, periodicals or pamphlets that might be available on the subject. . . .

R. W. Brown Chicago 20, Ill.

Can you advise the names and addresses of one or more manufacturers of square hole steel bushings as follows:

7/8 square hole—1 3.4 O.D. x 51/4" long. R. E. McDevitt, Dept. Mgr. Precision Tool Dept. General Cable Corp.

Any suggestions the readers may have for Mr. Brown and Mr. McDevitt will be

greatly appreciated.

We are in the market for a machine for sharpening Plow Shares. We know about trip hammers, but we understand there is a machine that rolls out the edge on plow shares.

If you know of a company which makes such a machine would you kindly let us

know.

J. S. Redpath Redpath Harvester Co.

Information given.

Time Study

Being in the Industrial Engineering field for several years, I have had the opportunity to read many varied articles on Time Study. Mr. Harold R. Nissley's articles in Time Study are by far the most forward and honest I have seen to date. Congratulations on your selection of articles.

I understand reprints are to be avail-

able soon. We here would greatly appreciate your adding my name to your undoubtedly long list for a copy of the complete series.

> George L. Deschambeau Production Standards Mgr. J. J. Tourek Mfg. Co.

It is no surprise to me that you are receiving such an enthusiastic volume of requests for Mr. Nissley's fine series. If still available, please send along four as I wish each member of my department to have one.

> R. R. Forte, Jr., Ch. Indust. Engr. Cambridge Thermionic Corp.

I have read Mr. Nissley's article on Time Study that appeared in MACHINE and TOOL BLUE BOOK.

They were well written, easy to follow and showed a wealth of experience and know-how in this field.

I should like a copy of the complete series when it becomes available.

J. K. Mills Time Study Engineer Meilink Steel Safe Co.

I am interested in obtaining reprints of the articles by Harold R. Nissley which were printed in the May, 1955, issue of the MACHINE and TOOL BLUE BOOK. If this is possible, would you please forward twenty copies of this series of articles to me. . . .

W. R. Evans Pittsburgh Plate Glass Co.

In the past issue of MACHINE and TOOL BLUE BOOK, you mention that it is planned to reprint the entire series of articles on Time Study in booklet form. When the present series is concluded, please place my name on your mailing list for this booklet.

In the articles received to date, I find Mr. Nissley has presented his ideas in a manner proving informative to the trainee and refreshing to the advanced time study man.

I am looking forward to future articles and to the booklet, which will undoubtedly prove "a must" for our library.

Howard C. Carlson Supervisor—Methods & Standards Div. The United States Time Corp.

for automatic operations 6000 strokes per hour!



Benchmaster now offers low cost conversion to AUTO-MATIC OPERATION! Adapts to punch presses, drill presses and other devices. Loads from hopper or by hand. Available in 12" and 15" table diameters with up to 24 stations. No installation problems...no machine alterations; simple 4 bolt mounting. Write for data.

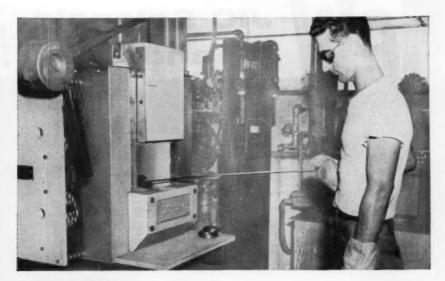
benchmaster

World's largest manufacturer of small punch presses and mills. 1835 W. Rosecrans Avenue, Gardena, California

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86

MACHINE and TOOL BLUE BOOK



SENTRY Guarantees Quality Controlled Tool Hardening

The Parsons Tool Company, Berlin, Conn., heat treats many items for many customers—each customer requiring a perfect job. Circular form tools (such as shown here), dies and all kinds of high speed steel tools are regularly hardened with consistent high quality.

With so many customers to please, an absolutely reliable furnace was required—and the Sentry Furnace became the obvious choice. The Sentry Diamond Block

Method of Atmospheric Control has repeatedly proved itself, guaranteeing complete freedom from scale, decarburization or other surface deterioration.

Sentry Furnaces successfully heat treat all kinds of high speed and air hardening steels.





Request Catalog M-26
Tells the full story of
Sentry Furnaces and The
Sentry Diamond Block
Method.

JIC Solenoid and Cover



Available on 700 Series Ross Air Valves when specified or may be installed on valves now in your plant.

- Cover protects solenoid against dust, splashing liquids and airborne contaminations.
- Can be manually operated without removing cover.
- Ample wiring connection space.
- * Ring type pressure connectors.
- Interchangeable with standard Ross cover and solenoid.

- Valve becomes electrically inoperative when cover is removed.
- Captive type cover fasteners.
- Thain to prevent loss of cover.
- * Threaded electrical conduit connection.
- Provision for piped exhaust.
- JIC Solenoid Cover and Head Assembly also available for 700 Series Momentary Valves.

Tomorrow's EnginAlRing Delivered Today . . . Anywhere



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S OPERATING VALVE COMPANY

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By Arnold Kruckman
Blue Book Washington Correspondent

Another World Threat

THOSE in Washington who should know are almost convinced that Israel is moving swiftly to launch what it calls a preventive war against the Arabs. The attacks against the Egyptians and the Syrians are increasing almost hourly. There are one million Israelites and forty million Arabs to oppose them. It is generally assumed, in the beginning the Israelites, with superior equipment, will administer defeats upon the Arabs. But in the meantime, with the wealth of Saudi Arabia to draw upon, and other funds, the Arabs are expected to arm themselves with equipment far beyond that which the Israelites themselves can obtain and maintain. As Washington sees the prospects, the Arabs, with their allies, will soon be able to overwhelm Israel.

There seems to be no doubt that when the Israelites are stopped, and get into real difficulties, some of the Western powers, directly and indirectly, will be drawn into any war that may be waged in Asia Minor and in the Near East. And this, of course, means another world war the proportions of

- machine tool industry discusses tools of war program with government
- machine tool orders still hold above year-ago levels
- Edward F. Lickey named consultant for Metals and Metallurgy Div., BDSA
- government plans to discuss import duty reduction with some nations
- new foreign aid regulations urged to help U.S. business firms

which can be perceived. No Western power apparently wants this war, but according to Washington sources it will be inevitable, unless Israel can be stopped before it really starts the preventive war.

Tools of War

Meanwhile, in common with other powers of the West, the United States is frankly getting ready for anything that may occur. This chiefly is the reason the Business and Defense Services Administration, the U.S. Department of Commerce, the General Services Administration, the Department of Defense and other Government Agencies, late in October, here in Washington, called together a large number of the machine tool industry operators to discuss plans to enable the American machine tool industries to start production on a month's notice. It was flatly and frankly stated that the object of the conference was to arrange the details for production of tools for war. The discussion turned around the terms of a proposed machine tool trigger contract. The Government leaders made clear it is planned to execute the contracts as soon as possible. Each machine tool builder is to have a signed contract in his safe. The contract would become effective upon the occurrence of what was designated as an "event", or upon notification from the responsible Government agency.

The contracts will specify the types, sizes and quantities of machine tools that the builders would produce under an emergency.

BDSA emphasized that approval of such a contract and placing it in the hands of the builders in advance of any emergency for which it might be needed would save more than a year in starting a machine tool production program, and would eliminate a bottleneck that retarded production in World War II, and in the Korean War.

The machine tool program is under

policy guidance of the Office of Defense Mobilization, with BDSA as the Agency delegated to determine tools to be procured on the basis of Department of Defense requirements. The General Services Administration will act as the fiscal Agency.

Under provisions of the contract, working capital equivalent to 30% of an order would be made available to a tool builder. The Government does not intend to buy machine tools under the contract, but will guarantee that the builders will suffer no losses incident to rapid acceleration of production to meet wartime requirements. This safeguard is considered the equivalent of an insurance policy.

To a considerable extent, divergent views of the Advisory Committee and Government officials on some of the contract features were resolved at the meeting. Remaining legal and technical problems will be ironed out as soon as possible by a three-man task group of Committee Members, appointed to work with BDSA, ODM and GSA representatives.

A Government official appealed to the task group for fast action in going to work on a final draft of the contract, stating that it is important to have the contract executed during the current fiscal year.

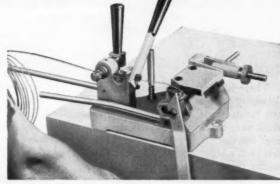
Machine Tool Orders

The National Machine Tool Builders Association reported new orders for machine tools in September fell to \$61,250,000 from the \$65,450,000 total recorded in August, but still were markedly above year-ago levels. Shipments during the month rose by more than \$9 million.

Make springs in seconds!

Save costly gpecial orders

WITH THE



DI-ACRO* Spring Winder!

This unique machine eliminates costly special spring orders, saves valuable waiting time. Winds flat, torsion, compression and extension springs to $1\frac{1}{2}$ " O.D. Handles round, flat and rectangular wire to $\frac{1}{8}$ " dimension. Note exclusive features in the hand operated Di-Acro Spring Winder which assure accurate tension and fast operation without special experience or skill.



TENSION CONTROL—Simply adjust to desired tension—the control keeps it uniform, for winding one spring or hundreds, and releases when each spring is wound.



WIRE CUT-OFF DEVICE—After spring is wound, release tension and use cut-off lever to quickly cut spring to desired length.



CAM LOCK—Simply feed wire under cam, turn handle and wire is securely locked to arbor while spring is wound. No threading required.

Free Engineering Service

Send us your spring forming problems—samples or dimension sketches—together with sufficient test material, and let us wind some sample springs for you free of charge. No obligation.



32-Page Catalog gives complete details on all Di-Acro Precision Machines—Spring Winders, Benders, Brakes, Shears, Punch Presses, Notchers, Rod Parters, Rollers.

RIGHT HAND LEFT HAND
TORSION

*pronounced
Die-ack-ro



O'NEIL-IRWIN MFG. CO. • 314 8th Ave. • Lake City, Minn.

Encircle No. 285 on Card, Opposite Page 65

Officials of major machine tool companies minimized the slight September order downturn. They blamed it partially on the Chicago machine show when everyone's attention was centered there. However, there is evidence that the Chicago showing of the new machines will push October business ahead of September.

Foreign Aid

There has been a growing feeling in Washington that an undue volume of the funds spent on foreign aid operations have been used to purchase whatever the foreigners need abroad. There has been a sharp conflict between Commerce Secretary Weeks and the Foreign Aid Administration. The latter feels that purchases for aid backed by American dollars should be on a worldwide competitive basis. United States interests, whose voices are heard through the Department of Commerce, feel that more of the money appropriated for foreign assistance should be earmarked for production of needed items by United States firms. Out of the internal argument is expected to come some new regulations assisting United States firms to get a good part of the business.

In August the Government of India spent over a half million dollars of American foreign aid with nine American firms, mostly on machinery of various kinds. In the Belgian Congo two highways are under construction at a total estimated cost of \$10.8 million.

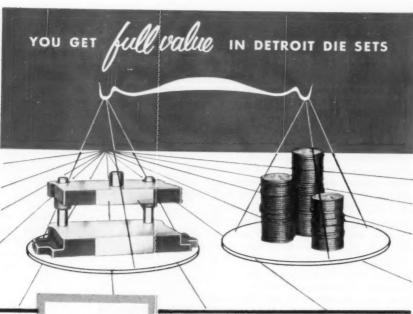
S. S. Miranda, Ltd., a firm in India, wishes to establish a machine tool plant near Bombay with the assistance and investment collaboration of an American manufacturer. The company would like to send some of its em-

ployees to the United States for training. The Miranda firm offers to invest \$316,000 of its own funds against the investment of \$842,000 by the Americans. The majority of the stock will have to be held by Indians.

In the light of these transactions and proposed transactions of India, it is interesting to learn from Clem Johnson, past president of the Chamber of Commerce of the United States, who has just returned from an extensive trip to Asia, that while he was in India they held a "Gallup" poll. Mr. Johnson told the Board of the National Chamber recently that one question asked was in event of a war with which side—the United States or Russia -should India go? The answer was with the United States, 7%; with Russia, 93%. Mr. Johnson said he had found American efforts apparently have



"Soothing music seems to help him over the rough spots!"



A die
is no better
than
its
die set



PRECISION-BUILT ACCESSORIES

In stock for immediate delivery is an extensive range of die-makers' accessories, including the new self-aling guide pin bushings with sealed internal oil wells for automatic lubrication of friction surfaces.

The big advantage of a full-value Detroit Die Set is that you get what you specify . . . factory-tested to assure you exact thickness of die holder and punch holder, true parallelism and squareness of surfaces, precision fit of pins and bushings. This means not only the accurate die set you expect, but also faster mounting, less maintenance, longer life. Reworking a die set in your shop can cost many times the difference between a "bargain" die set and afull-value Detroit Die Set. And, remember, our stock die sets are shipped within 24 hours; specials in remarkably short time.



3895 W. GRAND BOULEVARD - DETROIT 2, MICHIGAN Offices in Principal Industrial Centers not had a great deal of effect in building up any pro-Western-world feeling.

In Pakistan he found very considerable friendship for the United States, and a desire for an opportunity to do more business with U. S. business men.

Non-Military Exports

The Bureau of Foreign Commerce reports that during the first half of 1954 non-military exports going to Latin America, Western Europe and Canada were almost equal at approximately one-fourth each; during the first half of 1955, Western Europe took 30% of the total and was, by a substantial margin, the leading foreign market for U.S. goods. The Canadian share remained virtually unchanged at 24%, but the proportion going to the Latin American Republics declined by nearly 3%; and the share of the Far East also shrank.

Machinery Imports

Machinery imports, during the first half of 1954: Canada, \$70 million; American Republics, \$100,000; Western Europe, \$112.3 million; Far East, \$4.1 million. In 1955, first six months: Canada imported American machinery to the extent of \$78.7 million; the American Republics, \$100,000; Western Europe, \$128.9 million; the Far East, \$7.3 million.

Reduction in Import Duties

The State Department says the United States will confer with several nations early next year to discuss reductions in its import duties. These negotiations will take place under new powers granted the President by Congress during the recent session. The President has been empowered to cut

the tariffs 5% in each of the next three years on goods from countries which reciprocate with similar concessions. It also permits him to reduce gradually to 50% any duty rate higher than that.

Consultation has been going on for some time looking towards the holding of multi-lateral tariff negotiations beginning the first part of next year. The public hearings will be called before the Tariff Commission and the Committee for Reciprocity Information which is composed of representatives of several Government agencies.

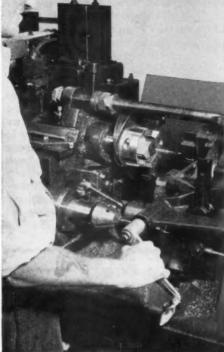
All thirty-five countries which are members of the General Agreement on Tariffs and Trade will be present at Geneva where the conference will take place. It is expected to last well into Spring.

Mineral Industries

As results of the 1954 Censuses of business, manufacturers and mineral industries, taken during the early part of 1955, to become available, summary data will be published in a number of series of preliminary or advance releases to meet public needs as rapidly as possible. The advance information will be expanded and finalized later in several series of bulletins presenting statistics by areas and by kinds of business and industries.

There will be separate releases for each State, the District of Columbia, and the United States and for each major segment of the business Census (retail, wholesale, and selected service trades); about 150 releases in all. There will be one release each for Alaska and Hawaii, combining retail, wholesale and service trades. Also a separate U.S.

Thread Cost—2/10¢ Per Piece



LANDEX HEAD THREADS 300 PIECES PER HOUR AT LOW TOOL COST!!!

These operations illustrate a case history of the economy and efficiency of the LANDEX Head, designed for cutting precision threads at high production rates on automatic screw machines and other "live" spindle equipment.

In this instance, V_2 " American Standard Pipe Threads are being generated on sprinkler frames cast of red brass. The threads are cut into a relief 3/32" wide.

The wisdom of the tool engineer in selecting LANDEX Heads for performing these threading operations is borne out by information secured from the cost sheets. Production consistently averages 300 pieces per hour, floor-to-floor time, at a total threading cost of two-tenths of a cent per piece. Tool cost was held to a minimum with 5,000 pieces being threaded between chaser grinds.

This is just one example of many successful applications of the LANDEX Head to jobs requiring high-speed thread production at an economical cost. For additional information, write for Bulletin F-90,

Machine COMPANY

WAYNESBORO . PENNSYLVANIA



THREADING MACHINERY-THREAD CUTTING DIE HEADS-COLLAPSIBLE TAPS

Encircle No. 287 on Card, Opposite Page 65

Summary release for public merchandise warehouses. These releases will come out the latter part of 1955.

There will be releases of general statistics (establishments, sales or receipts, payroll, and personnel) by counties, cities and standard metropolitan areas and kind of business. Also cross-classification by kind of business for standard metropolitan areas and for cities and counties with a specified number of establishments (200 establishments or more for retail, 100 or more for service, and 50 or more for wholesale). These are to be published at the end of 1955 and in early 1956.

There will be separate bulletins for each major segment of the business Census (retail, wholesale and selected service trades), for such subjects as sales size of the establishment, employment size of establishment, legal form of organization, credit, employment and payroll, single units and multi-units;

also separate bulletins for public merchandise warehouses, hotels, laundries and cleaning plants, petroleum, and wholesale commodity lines. About forty bulletins in all. Detailed statistics by kind of business and frequently by geographic area, together with trade bulletins are to come out late in 1956.

In the Census of manufacturers there are to be separate releases for each of about 450 individual industries, to be released at the end of 1955 and in early 1956.

The Census of mineral industries, covering separate releases for thirty-four industries or groups of industries, will include a United States Summary for all industries, enumerating shipments, values added, employees, man-hours, principle expenses, capital expenditures, power equipment and water intake—historical data for each industry as a whole, and 1954 data by States.

The End.

We're Going To Have A Party!
Why Don't You Help Us Celebrate

Machine & Tool Blue Book's 50th Anniversary By Joining Our \$2,500.00 Production Contest. It's Fun. It's Easy.

Everyone in the Metalworking Industry is eligible.

Simply write in your own words the time,
or money-saving, or production-increasing
idea used in your shop.

(see pages 134-135 for more complete details and official entry blank.)



EXCLUSIVE HIGH-STRENGTH DESIGN

Lamina Ring Clamp Guide Bushings are designed expressly for use on heavy duty and bossed dies where large diameter pins are required. Due to the fact that the guide pin contacts the bushing at a point beyond the bearing face of the bushing head, the possibility of the head breaking off is eliminated.

SIMPLE, COST-SAVING ASSEMBLY

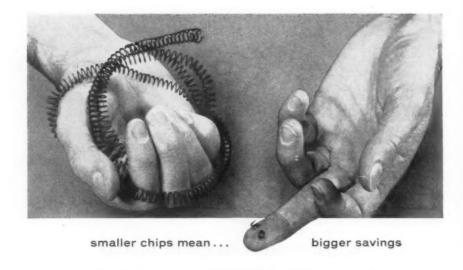
Like all other Lamina Guide Bushings, these heavy duty bushings are assembled with a wring fit in the shoe. Lamina Ring Clamp Bushings also are prefinished by precision honing at our plant. This not only eliminates distortion but saves considerable assembly time, effort and handling of large, heavy shoes.

AVAILABLE IN TWO MATERIALS

Lamina Ring Clamp Guide Bushings are available in both solid Ampco bronze and in hardened steel with bronze plated on the

I.D. This latter bushing offers the ideal combination of long wear characteristic of hardened steel and the free-running action of bronze.





Cut costs with RYCUT steels!

Three new Ryerson leaded alloys

These short, fast-breaking chips have real meaning to cost-conscious purchasing and production men. In an ever-increasing number of shops, small chips like these mean that the switch has been made to Rycut steels. They mean that tools are turning faster—that production is up as much as 200%.

The secret of Rycut's machining speed is a minute quantity of lead, finely dispersed throughout the steel. This acts as a lubricant between tool and steel. The results are revolutionizing machine shop practice:

- Up to 200% more parts can be produced per machine hour!
- Tool life is lengthened as much as 300%!
- · Finish is improved!

There's a Rycut leaded alloy for every application. Use RYCUT 20 when you need a

carburizing alloy; RYCUT 40 for .40 carbon alloy applications; and RYCUT 50 for .50 carbon alloy uses. Every one is a cost-cutter.

Figure how much this increased production and longer tool life would lower costs in YOUR shop—and raise your profits! Call your nearby Ryerson plant today . . . large stocks assure you of quick shipment.

NOW LEADED PLATES—Ryerson's New E-Z Cut is the first leaded plate steel available from stock. It cuts faster, polishes easier then other free-machining plate steel.

LARGEST LEDLOY STOCKS—Ryerson has them and this leaded carbon steel is the world's fastest cutting.

RYERSON STEEL

In stock: Bars, structurals, plates, sheets, tubing, alloy and stainless steel, reinforcing bars, machinery & tools, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK + BOSTON + PHILADELPHIA + CHARLOTTE, N. C. + CINCINNATI + CLEVELAND DETROIT + PITTSBURGH + BUFFALO + CHICAGO + MILWAUKEE + ST. LOUIS + LOS ANGELES + SAN FRANCISCO + SPOKANE + SEATILE

Comprehensive Tool Control System Acts as Nerve Center of Plant

"... Be Sure You Need What You Order."

RAPID strides have been made in the field of hand power tools as a cost-reducing medium. This swing from electrical to air driven tools becomes more evident each day. At one time, air tools were considered too bulky and far too heavy, but redesign has reduced the size and weight to the extent that fatigue caused when operators used the heavier tools is also reduced.

The Carrier Corporation has approximately \$1,000,000 worth of hand power tools in stock in the various tool cribs according to the usage on the production line. We carry about 16,000 tool and supply items including approximately 5,000 necessary repair parts. This will give you some idea of the investment Carrier has to protect, by a comprehensive Tool Control System.

It has been proven economically sound for us to establish a repair department for the

By T. F. Dundon, Supt., Perishable Tools & Supplies, Machinery & Systems Div., Carrier Corp., Syracuse, N.Y.



Display cabinet used by shop personnel to obtain technical information relative to their work. Terence F. Dundon, superintendent, is shown at right.

maintenance of electric and air power tools along with other tool repair work. Master records are kept on each tool which states identification and its dispersement. Records are kept on each tool as to the amount of service each has required. A simple report is made out which identifies the power tool, the work and parts put into it, and the cause of the breakdown. A copy of this report is sent to the supervisor of the division using those power tools. From this report, the power tools' upkeep can be evaluated and corrective measures taken if it is necessary in accordance with our preventive maintenance program.

Tool Handling Procedure

If a new employee, or in the case of an employee changing divisions, needs tools for his job, he merely goes to the tool crib assigned to his division and draws the required tools. If there are no used tools available, his foreman gives him a requisition for the necessary new tools.

The operator must sign a tool check for all tools, with or without a requisition. The requisition is forwarded to our accounting department—the tool check remains in the crib until the tools are returned.

If an operator's employment is terminated, it is the duty of his foreman to see that the man has turned in his tools.

THIS SYSTEM WILL:

- · control inventory
- · improve quality control
- · prevent theft
- provide economical maintenance
- · increase employee responsibility

	TEST SHEET
70: Supervisor of Tools & Supplies	
Fo	or Tools or Supplies
Tool or Material on Test	Tool or Material in Use
Supplier	Supplier
Price	Price
Resson for Test	Yearly Deage
Requested	Performance
Test Started	
Test Completed	
Performance	
Quality in Stock	
Anticipated Savings	
stipulated for the job, this test s Supervisor of Tools and Supplies, g is going to replace and savings, if h case of tools and supplies stipu	iving full particulars as to what it any, and disposition of present stock. lated, and later discontinued for other of inventory on hand must be absorbed
Remarks:	
If approved, this item will superse	de
	DATEL

This test sheet places the responsibility on the department making a change in tools.

If the man has furnished any of his own tools, he is required to submit his tool box for examination—his tool box will be sealed with a wire and lead seal, and a pass issued by the Master Crib to take his tool box from the plant.

Inventory, Theft and Quality

Other tool handling procedures deal with inventory, theft and quality of tools. In order to control our tools and prevent hoarding, it will be necessary to take a physical inventory of tools that are out on the job against those

the man has signed for, every two months. The man simply brings his tools to the crib for checking and the tools are reissued or put into stock or sometimes replaced—according to the condition of the tool.

With regard to theft—workmen have had their boxes broken open and company tools removed on a number of occasions. Some men report this—others do not mention it until they terminate their employment with us. This may only be defensive thinking; but it should be made a set rule to report

Tools ready to be milled for carbide blanks in our tool reclaiming program. Also steel ready to be milled for first run tests.



such thefts to our patrolmen. They can then investigate and, if it is a genuine case of theft, a note can be made in order to cover this man against the value involved in the missing tools.

It is our desire also to control, as much as we possibly can, the quality of our tools and any tool that may be defective should be returned to the Tool Crib so as to enable us to get credit for same from the supplier.

With regard to the selection of attendants, no longer is the crib a spot for some semi-retired workers or an easy berth for men who have slowed down. Whether the attendant is young or old, he must possess these qualities: alertness, a knack for details, a friendly personality, a vein of humor, and a highly developed sense of responsibility.

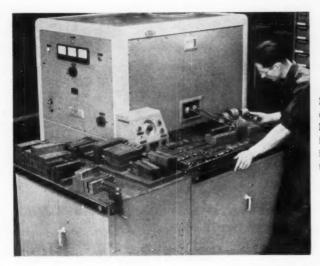
Each attendant keeps a log. In it are entered such information as the hours worked, complaints received, troubles encountered, requests for special tools, issuance or ordering of wrong tools and the circumstances, and other pertinent particulars. A record of this sort presents a picture of crib operations

and its problems, and serves as a basis for improvements and remedies. The duties of a crib attendant are also listed in the front of the log book.

Catalogs and other literature of manufacturers of the machines, tools and supplies are kept by each attendant. This practice is a part of the educational program conducted to familiarize the attendants with the tools they are issuing. Another phase of worker education is the practice of permitting manufacturers' representatives access to the machine operators and certain workers for the purpose of assisting the latter. This procedure is especially advantageous when machine or tool trouble develops.

Special Services

To accommodate the workers, we have made arrangements with a local laundry to clean our employees' coveralls and other work clothes at a fair price to the employee. The laundry services the individual cribs weekly. No employee is requested or required to use this service—but it is established for his convenience. Each crib attend-



Retipping tools with carbide by induction heating. This machine is also used for removing broken or worn tips.

POWER TOOL PERMIT REPORT

TO:

DATE:

PROM! T.F. Dundom

CHG. NO.

DESCRIPTION SERIAL COST OF NEW TOOL LAST
NEW TOOL ISSUE DATE REPAIR DATE

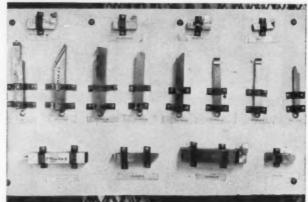
QUANTITY PART NO. NEW PARTS USED PLOE
DESCRIPTION UNIT TOTAL

A simple report identifies all power tools, the work and parts, and causes of breakdown.

ant handles the related work involved in the department he is serving. If it is required by the company for him to wear special clothing, the company furnishes the clothing, and pays for the upkeep. When company property, the clothing items are put on tool checks and the tool checks placed on the tool board.

Tool Salvage

The Master Crib also runs a central repair and salvage station. Here all manner of tools and supplies are reconditioned, for further use—wrenches, reamers, hand and rotary files, paint guns, spark plugs, leather sleeves, aprons and other products. One interesting feature of the salvage work is



High speed steel and carbide tipped tools made for first run jobs at competitive prices.

that about 500 pairs of gloves are cleaned and remated monthly.

Worn down sanding discs are cut to smaller diameters, since only the edges are worn. The smaller discs are then used on other work. High speed tools, broken or otherwise unsalvageable, have been disposed of to local scrap dealers.

Comparative Tool Performance

Data on the comparative performance of the different kinds and makes of tools are readily available from the records of the cribs under Tools and Supplies. How this tool information is revealed and recorded is shown on the rated listings of "Approved Manufacturers" which carry comments on tool preferences.

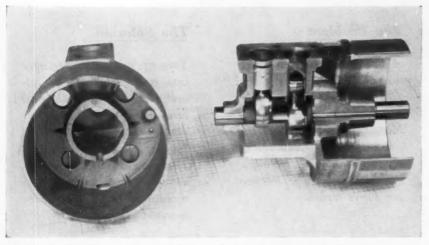
In order, however, that we will be well advised, and take full advantage of any claimed improvements that may have taken place in regard to tools and supplies, we have a very simple test sheet on which we record the tool or supply on test, their comparative cost, and the value of our present inventory on hand.

This prevents promiscuous buying and at the same time gives us a true picture of actual performance under our production conditions. Our findings are not confined to our personnel only, but in a great number of cases, are shown to the manufacturers' representatives. Such action, we have found, creates good will and gives ample opportunity for them to offer any constructive criticism they may have.

It is self-evident that an effective system of tool control is a sound investment, and a vitally important part of manufacturing. It will not only help to control inventory, but reduce operators' pedestrian costs and act as a medium for quality control. It also supplies useful data which can act as a guide to intelligent purchasing. Inactive tools which need only a slight repair are put back into active service.

Another cue may readily lie in the attitude assumed by the crib attendants, backed by their management, in carrying out the principle of "order what you need—but be sure you need what you order."

The End.



One-piece compressor and motor housing for new York room air conditioner is die cast from aluminum. Left, motor end of housing; right, cutaway reveals two die cast pistons and connecting rods.

test shows undiminished results for 70,000 hours

Machining Eliminated By Die Casting One-Piece Aluminum Compressor

A LIGHTWEIGHT, compact, and economical compressor—heart of the new York air conditioner—has been made possible by die casting the double cylinder compressor housing of aluminum.

On early postwar models, York had utilized die casting for the compressor unit only. Encouraged by continuous tests which showed undiminished results over some 70,000 hours, York designed a combined compressor and motor housing.

The compressor and motor housing is a complex unit that allows virtually no dimensional tolerances. Lightweight, small size, cast-in-bearing surfaces and cylinder linings, and concentricity with exact location of cylinder center lines were key design factors. This last problem was solved by establishing

three equidistant chucking surfaces in the die, which in turn produced like surfaces on the raw die casting. Centers are located on a circle concentric with, and exactly perpendicular to, the center line of the housing shaft.

A cone, of which this circular plane is the base, reaches its apex at the small bearing bore in the compressor and of the housing. Using this cone as a reference, all center lines and true surfaces are established throughout the die casting. Longer-wearing bearings, pistons and cylinders result from "cone-based" machining set-ups.

By die casting the housing, York obtained the lowest possible weight, using aluminum alloy ASTM Spec. SC84B.

The End

The Problem

A woodworking manufacturer desires a more economical and faster method of producing 24" diameter flat belt pulleys. His old method was to machine the pulley castings on a boring mill with tooling of the single point type, one tool per turret station.

The Solution

Turning tools were arranged into gangs, mounted in specially designed holders so that several tools are cutting at one time. This was accomplished by using a five-sided tool turret. The main saving is the elimination of tool setting and work measuring on part of the operator.

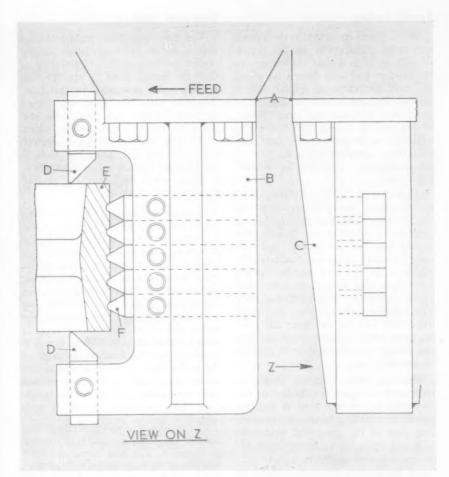
Machining Time Reduced From 2-1/4 Hours to 14 Minutes With Use of Gang Turning Tools

by **Tom Brown,**Consulting Tool Engineer
London, England

A CHARACTERISTIC of vertical boring and turning mills is the high power available for rotating the work table. It is an economical proposition to utilize this power by arranging turning tools into gangs mounted in specially designed holders so that several tools are cutting at one time. The five-sided tool turret usually fitted to boring mills is particularly suitable for the

rigid mounting of tool gangs. On batch production, the tooling and the holder can be detached from the turret as a single unit and stored easily until needed for a further batch of work; by using cemented carbide tool tips, it is possible for tools to be used on hundreds of components before resetting becomes necessary.

In one firm of wood working ma-



chine manufacturers, 24" diameter flat belt pulleys were required in considerable quantities in the course of a year, although they were put through in small batches. These pulley castings were always machined on the boring mill since it was the machine most suitable for swinging the large diameter but, because of the small batches put through, the tooling adopted had been of the single point type, with one tool per turret station. This was one case where the significance of the large annual output had been missed or been obscured by the relatively small batches machined at one time. In consequence, the value of special tooling and better planning of the job had not been appreciated.

Special tooling

When it was realized that the annual output of pulleys was in the region of 300 or so and that the design of the product had been frozen for about 10 years, the value of special tooling became apparent. Another interesting point was that the maximum power of the vertical boring mill was rarely utilized; single point tools, used one at a time, absorbed but a fraction of the horsepower available for removing metal.

A good work holding fixture existed for mounting the pulley castings on the machine table and the machining processes involved were to bore the central boss of the pulley, face the pulley outside diameter, machine the width of the rim and chamfer the inside edges and, finally, to crown the pulley rim with a broad forming tool. The holding fixture, boring tools and the crown forming tool were adequate for their work, but the rough turning and facing were thought to be capable of speeding up.

The tool layout adopted finally is illustrated in figure 1. One face of the five-sided tool turret is at A and attached to it by four bolts is the foundation plate of the gang tool holder B. The tool holder is an approximate U-shape, mounted sideways and is stiffened by shallow struts C welded to the sides. The holder carries a pair of vertically projecting facing tools D and D; the tool points are spaced apart for a distance equal to the finished width of the pulley rim E.

Five rough turning tools F are fitted side-by-side in a slot which is machined transversely in the holder each one being secured by a single socket head set screw.

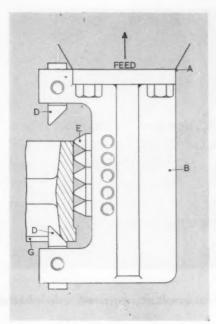
Horizontal feed

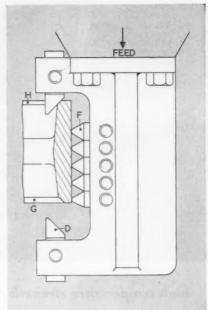
The first operation on the pulley rim is to set the tool turret to the correct position on the turret slide so that the facing tools D and D will remove equal amounts of metal from the pulley rim. The turret is traversed horizontally and the two tools machine the rim to correct width, which is 4". The feed is continued horizontally and the five roughing tools F are plunged into the pulley diameter to a depth which will give the desired rough turned diameter.

Horizontal sliding of the turret then ceases and the saddle is locked in place. The next operation is shown in figure 2 in which the turret is traversed upward through a distance equal to the space between two adjacent roughing tool points. In the example shown, this distance is 56" and it can be seen that with this relatively short traverse, the major part of the rim circumference is rough turned to size. When the first roughing tool has reached the edge of the pulley rim the sloping side of the lower facing tool comes into contact with the casting and bevels the inside edge at G.

The third tool movement completely finishes the pulley rim and is illustrated in figure 3. The tool turret traverses downward through a distance of 144" to remove the step on the pulley periphery and to bring the upper beveling tool into contact with the upper edge of the rim to bevel it at H.

From stage 1 to stage 2 requires \%" of traverse and the final stage was stated to require 1\%" of traverse. Half of this latter, however, is a quick traverse movement performed in about 3 seconds. The actual traverse taken





at a rate of 1/64" per work revolution is, therefore, a total of 1¼" to completely machine the pulley rim which is 4" broad. Also, the bevels are applied at no extra expenditure of traverse time. It will be appreciated from the foregoing that gang tooling is profitable where there is plenty of power available for turning the work.

One of the main savings derived from gang tooling however is the elimination of tool setting and work measuring on the part of the operator. Since the tools are pre-set in the holder, he decides on the slide settings horizontally and vertically when machining the first piece and then works to these settings, as indicated by the machine dials, for all subsequent pieces in the batch.

In the particular example described here, the time for machining a pulley completely was reduced from 2½ hours to 14 minutes, floor-to-floor.

The End

\$2,500.00 IN CASH PRIZES!

Enter MACHINE and TOOL BLUE BOOK'S 50th Anniversary Production Contest See Pages 134-135 for details This Norton Alundum ceramic tool is machining SAE 4140 steel on a 15 h.p., 18" engine lathe. Speed is 1500 S.F.P.M., feed .010" per revolution and depth of cut .250". Inset shows new tool bit held in early experimental tool holder.

high temperature strength - no coolant required - no chatter

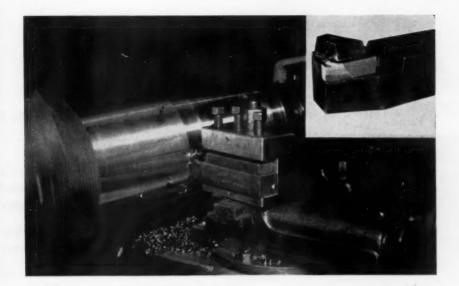
A Faster, Less-Expensive Cutting

A NEW aluminum oxide, ceramic cutting tool demonstrated cutting speeds of three times faster than normal and excellent surface finishes in a recent test program conducted at the Rodman Laboratory of Watertown Arsenal.

These Alundum tool bits, developed by the Norton Company of Worcester, Mass., are entirely in the development stage and are available only in limited quantities to industry for research and machining studies.

One importance of this new tool to industry lies in the abundant supply of ceramic materials. In addition, ceramic cutting tools may have an added advantage of being considerably less expensive than conventional tools.

Machining tests at Rodman Laboratory on steel (SAE 1020 and SAE 4140), commercial brass and low alloy cast iron show that the hardness, high temperature strength, and wear-resistance properties of the cutting tools are superior to metallic tool compositions. By means of heavy, rigid tool holders, such as developed by the Rodman Laboratory, ceramic tool characteristics of lower tensile strength at room temperature plus less thermal shock resistance, have been overcome. Using solidly constructed engine lathes with high power



or tool fracture - high machining speeds

Tool Passes First Hurdle

capable of high speed operation, ceramic tool advantages can be fully realized.

Higher Speeds

Because they can be operated at higher speeds, ceramic tools cut up to three times faster than normal in these tests, required no coolant, and produced excellent surface finish. As more rugged machines with increased power become available, it is expected that even greater superiority will result.

Workpiece and cutting tool remain cool to touch when the tool is operated with proper tool geometry and chip breaker adjustment. Because of the remarkable heat resistance of the ceramic tool, blanks may be shaped by dry grinding with diamond wheels. Resharpening is easily done on the same metal-bonded diamond wheel used for sharpening carbide tools.

These ceramic tools cut cleanly and show minimum scoring of the workpiece. Such characteristics are attributed to the absence of top face cratering by chip friction of the ceramic tool due to the low affinity of aluminum oxide for metals.

On cast iron containing sand holes

Tabulated data on this high density ceramic product showed the following on SAE 4140 steel:

	Cutting Tool Material			
Factor	High- Density Aluminum Oxide	Carbide Grade C-6	Carbide Grade C-7	
Speed (sfpm)	1000	500	500	
Linear Feed (inch)	0.0075	0.0075	0.0075	
Depth of cut (inch)	0.125	0.125	0.125	
Tool Travel (inches)	82	80	90	
Chip Platform Cratering (inch)	None	3/32	Slight	
Edge (Land) Wear (inch)	1/64	3/64	2/64	

which normally cause machining toubles, the ceramic tool cut through without chatter or tool fracture.

Later tests have shown that considerably higher machining speeds are possible.

This table shows the ability of the

tool to remove steel at a higher rate than is usually found in other tools. It demonstrates also that the ceramic tool resists cratering and dulls more slowly even at high speed by a factor of at least two to one.

The End

Help Us Celebrate Our 50th Birthday by entering Machine & Tool Blue Book's \$2,500.00 Production Contest

Everyone in the Metalworking Industry is eligible to enter. It's fun. It's easy. Simply write in your own words, the time-, or money-saving or production-increasing idea used in your shop. (See pages 134-135 for more complete details and official entry blank.

Norgren

av-Lube

as applied by System Square D Co.

o multiple tapping operation, speeds production 30%

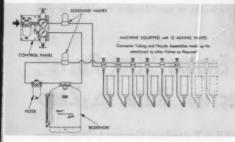
and in addition:

eliminates time and labor formerly required for draining and wiping tapped parts

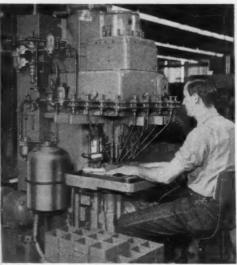
relieves one man for more productive work

elimination of flood system greatly improves working conditions

substantial saving in lubricant.



This tapping machine in the Square D Company production line handles a wide variety of tapping operations requiring as many as 12 taps in simultaneous operation. On job shown, tapping 3 holes in each of 2 switchbox covers, Norgren Spray-Lube System increased production 30% ...

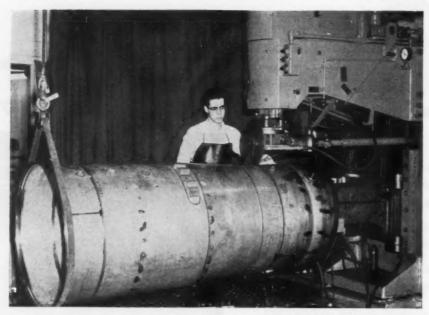


eliminated the cleaning process. Even greater increases were reported on other jobs.

The unpleasant and hazardous disadvantages of the previous flood system, splashing lubricant over the operator and the surrounding floor, has been eliminated by Spray-Lube. Lubricant saving (Stanicut No. 107) has been substantial. Solenoid valves permit the Spray-Lube System to be actuated only when taps are approaching and contacting the work.



For complete data on this Norgren Spray-Lube application write for Blueprint SL 5 or phone the Norgren representative listed in your telephone directory classified section under Norgren Pneumatic Products.



Here an operator is producing a gas tight seam weld on an after-burner section. Without the proper facilities for quality control, continuous welds to specification would be nearly impossible.

Quality Control of Jet Engine "Hot Parts" Drops Rejection Rate to Zero

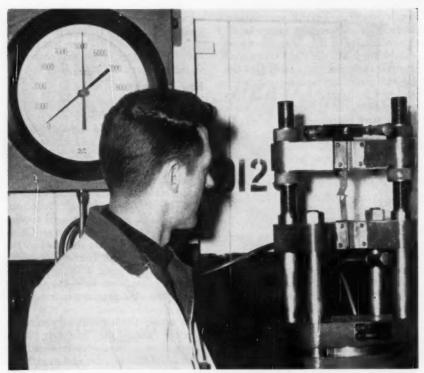
by

George Hugo, Vice President and Plant Superintendent

Portland Copper & Tank Works, Inc.
Portland, Maine

WE AT Portland Copper & Tank have developed a Quality Control program in our welding department which can truthfully claim that the rejection rate of finished products is nearly zero.

Our finished products fall into two main categories—those we fabricate for the U.S. Air Force and those fabricated for private industry. Our Air Force work is devoted essentially to the fabrication from super alloys of jet engine after-burner assemblies.



Above is shown the method of testing shear strength of resistance welds. This is a major factor in the production of structurally sound welds.

". . . the process may be slow-but get it right."

In establishing our Quality Control program in the welding department we were presented, of course, with certain minimum standards by the Air Force.

Our aim is to maintain the quality of finished products for both civilian and military at the optimum point throughout fabrication. In conjunction with Quality Control and efficiency, we increased the plant's effective production space to 150,000 square feet. We added a range of new equipment,

including an Eclipse annealing oven so that we would control heat treating of finished assemblies right in the plant, two Elox disintegrators and an Elox electronic drill.

The fabrication of jet engine "hot parts", as the after-burner components are called, must be worked to extremely close tolerances of dimensions and strengths. To insure production within required limits, Air Force specifications call for certain tests to be made at

hourly intervals on the various steps in their fabrication. The theory behind this, of course, is that if an hourly test should not fulfill the Air Force's specs, then all those hot parts fabricated during the preceding hour's run must be assumed faulty and be rejected. These tests, plus regular inspection of the completed after burner, would, it was felt by the Air Force, contribute to keeping rejections at a minimum.

Some 86 different pieces fabricated from the super alloys make up the complete after burner assembly. Inconel-W is used primarily, but Inconel-X, Haynes Alloy No. 25, Multimet and other super alloys also are utilized. These materials are almost as costly as precious metals.

After Burner Rejection

All along the line, the possible rejection of individual pieces can add up to an appreciable amount of money. Naturally, the rejection of a completed after burner would represent an even greater monetary loss, in both material and labor. This fact forms the basis of our Quality Control program.

In theory, the series of hourly tests should preclude the possibility of the rejection of a finished after burner. But every manufacturer is constantly on the lookout for the bad part that tries to sneak through, and inevitably is caught

in final inspection.

In the welding department, then, our Quality Control efforts were aimed at eliminating from the outset the rejection of finished after burners. In addition we wanted to keep at a minimum the rejection of component hot parts as they were fabricated into the assemblies.

To accomplish these measures the Resistance Welding Department, under its foreman, Creed Ray, instituted a number of checks. Perhaps the most

significant of these was the establishment of not merely hourly tests, as called for by the Air Force, but sample tests for every single welded component in the fabrication.

How It Works

The 86 parts of our jet-engine after burner include: A flange consisting of 3 pieces seam welded together; 4 cone sections; a nozzle with 12 stiffeners and two seals; a deflector with 6 stiffeners, two beads and two bearing supports; a corrugated liner made up of three seam welded sections holding 32 pads, and 28 small segments. Deflectors, flanges, pads, cone sections—all require spot and/or seam welding. Other processes naturally are involved in the fabrication, such as riveting, forming, electronic machining with an Elox disintegrator, etc., but only the welding Quality Control program is considered here.

In action the fabrication procedure develops along the following lines. Super alloy materials are first laid out according to engineered templates. Then the various pieces are cut out and formed, either in separate operations, with the use of rolls, or blanked and formed by presses in a single operation. Once formed to their approximate shapes the pieces are ready for welding.

When they are delivered to Creed Ray's welding department the pieces first are tacked by portable spot welders. Then the welded part is immersed in a bath of chemical cleaner and cleaned by the hot-tank method. The part remains in the cleaning solution for about three to five minutes.

Once cleaned the part is thoroughly washed with hot water and then stacked together with other cleaned parts, ready for seam welding.

HOW

CUT COST

OF
PRECISION GEAR PRODUCTION

THIS FEATURE: "Independent selection of speed, feed and indexing," sets the Hamilton Precision Small Gear Hobber apart from the field,

AND ENABLES the users of this machine to.

vary speed and feed to suit the
material being machined.

THIS FACT, and a "reserve of accuracy"

built into the machine, work spindle
and hob spindle runout of less than
.0002" as an example,

contributes to more gear precision with no sacrifice of gear production,

OR INCREASED gear production with no sacrifice of gear precision, OR BOTH!

Prices and specifications without obligation

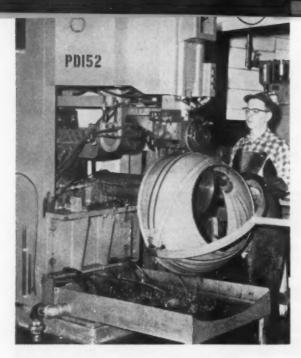
ASK FOR FREE BULLETIN 5410

Address

The Hamilton Tool Company 826 South Ninth Street Hamilton, Ohio



Encircle No. 291 on Card, Opposite Page 65



Quality Control is a most necessary factor in resistance welding. Here an operator is shown making a continuous type weld.

We have made it a point at Portland Copper & Tank to synchronize our production so that all parts are welded the very same day that they are cleaned and stacked. By this means, we avoid accumulating a large backlog. With one-day operations we avoid re-cleaning and the costs of work duplication.

We utilize three types of resistance welding machines in our department: Three-phase, 150KVA Thompsons, and single-phase, 150KVA Taylor-Winfields and Nationals, equipped with G. E. Synchronous Controls.

Before the actual welding takes place, Creed Ray himself sets up a machine for a particular operation. Then he and his crew make repeated test runs until both they and the Air Force representatives are satisfied with the various settings. When these settings are finally okayed, they are recorded on data cards for the welding machine operator to follow on each particular step.

Test Runs

Once an operator is assigned a job, he immediately runs his own series of tests to confirm the settings indicated on his data cards. Each operator knows that once production runs begin, no machine settings can be changed more than $\pm 10\%$ for a particular step without official clearance. That official clearance is forthcoming only after adjustments and extensive test runs are made by Creed Ray—and new okays are received from the Air Force.

In all production tests a series of test coupons are run off. This consists of three sets of two or more strips of super alloy, each strip representing the same width and thickness, and the same finish as the materials being fabricated.

ONE MAN CREW

ORTELVATO

One man can lift, lower, and transport compact, heavy loads which, without Portelvator, would require the combined strength of three or more men.

Maintains materials at proper machine feeding level.

Speeds transfer of tools, dies, and fixtures between machine and storage.

Reduces injuries to workmen, and damage to tools and materials due to manual handling. Provides a portable work bench when and where required.



WANT MORE FACTS? Write for FREE Hamilton Bulletin No. 5346. Address The Hamilton Tool Company, 826 South Ninth Street, Hamilton, Ohio

Encircle No. 292 on Card, Opposite Page 65



Creed Ray, Foreman of Resistance Welding, is shown making up a test coupon of a seam weld. This is done every hour and also before any production

About one inch wide and four inches long, a test piece is used for each layer of the material actually being worked, so that the test coupon is as close to a miniature duplicate of the fabricated

production part as possible.

As indicated earlier, we run a series of test coupons for every single welded part that we fabricate. Thue, if a particular operator happens to be turning out, say, 20 parts an hour, he does not make merely one test at the end of the hour as the Air Force requires—and risk having to reject all of the parts, should the machine somehow not follow the settings. Instead, he runs a test series after each part is welded. This is over and above the hourly checks required by the Air Force. If his tests show fault, then only the last part need be scrapped.

The procedure understandably is somewhat slower than it would be if we were merely to follow Air Force minimum standards. But actually our total rate of approved output is much greater—and the resultant rate of final rejections is extremely low.

The Test Series

In practice a test series might work out something like this. We're spotwelding two cone sections in the after burner assembly. Two pieces of 0.062inch Inconel-W are our materials. They already have been tacked, of course, and thoroughly cleaned. Our welding machine is set according to the original data cards.

Once we complete our weld we set up a test coupon of two one-inch-wideby-four-inches-long pieces of the same Inconel-W, insuring that we're dealing with the same gauge, and finish as our original materials.

All resistance welding is done in accordance with AN-W-32 (Mil 6858), the Air Force specifications.

All welding machines have been qualified to cover the range of settings

used in production.

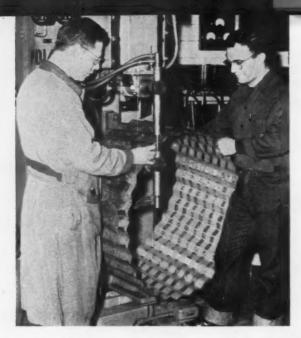
All production schedules have been certified to meet the requirements of AN-W-32, which require in part, the signature of an authorized inspector. They also require tensile shear tests and Marco sections, which are witnessed by an Air Force quality control representative.

Routine shear and Marco section tests are conducted as follows:

- 1) At the beginning of each shift.
- 2) At intervals not greater than one



Encircle No. 293 on Card, Opposite Page 65



All of the factors which go into the study and control of resistance welding are consummated in the final product. Here operators are shown spot welding a liner section for jet engine.

(1) hour.

Upon replacement of welding electrodes.

4) Each time a change is made in the welding schedule.

All tests are conducted by qualified personnel who are responsible for the control of machine settings and welding schedules. Weld Data cards are made available to the machine operators at all times which show the proper machine settings for all variable controls, stock thickness and alloys for each and every job.

All parts are properly cleaned, either hand-cleaned or chemically-cleaned in tanks (depending on size and shape of parts).

Check lists on the maintenance of welding machines and control panels are kept, showing daily, weekly and monthly, check points. Results of these checks and repairs made, if any, are kept on file. Special equipment such as

Tensile Testing machine and Force Gauges are tested periodically and recalibrated if necessary.

Maintenance of welding electrodes at regular intervals is maintained by the use of a small engine lathe, and ground radii cutters.

Complete daily records are kept showing (a) Job Number, (b) Operator's name and number, (c) Type and serial No. of machine being used, (d) Time job started and finished, and (e) Results of shear and marco test specimens.

Routine Shear Tests consist of making three sets of test specimens, pulling apart in a tensile testing machine and averaging the tensile strength. This must meet their requirements, which will vary with stock thickness, material, etc.

Marco Tests

Routine Marco sections tests consist



"Precision Holding" Tools solve difficult drilling, tapping and reaming problems...reduce costs!

Newest Floating Holder simplifies tool changes, assures free float

Here's how Greenlee Bros. & Co. uses the Scully-Jones new "JT" Lock and Eject Collet Type Floating Holder on multiple-spindle transfer units. With the double-gear spline-drive principle, these floating holders compensate for any misalignment between tools and work...essily maintain close tolerances...reduce downtime and damage to cutting tools...speed and simplify tool changes...reduce maintenance troubles and costs. With true freedom of float, they eliminate "dead spots" and cramping—conditions that may be affecting tool life and quality of work on your drilling, reaming, and tapping jobs! Write for Bulletin 8-50.



Drill and Tap Chucks cut production costs on Greenlee transfer unit

Greenlee engineers put Scully-Jones Drill and Tap Chucks on this 16-station transfer unit to provide a positive, accurate drive for the cutting tools. Carefully hardened and ground, they resist nicking, give long life under heavy stresses or loads, and run concentric. They help you save on setup time, downtime, and tool re-





Adjustable Adapters speed tool changes and adjustments

Scully-Jones Quick-Lock Adjustable Adapters help this BARKESDRIL 10-station double-end trunnion machine operate at near capacity. The "pilot nose" makes it easy to insert the adapters ... minimizing setup and downtime for tool changes. Quick-Lock Nut provides quick, accurate adjustments for tool depth at each spindle or in a tool presetting program. Cutting tools are quickly removes by using Scully-Jones new "Keyhole" Tool Ejector in "keyhole" Tool Ejector in "keyhole" slot. Damage often caused by conventional drift is eliminated. Write for



SCULLY-JONES AND COMPANY, 1907 S. ROCKWELL ST., CHICAGO 8, ILL.

SCULLY-JONES

"Precision Holding" for holding precision

Call your Scully-Jones representative or distributor—factory-trained "Precision Tool and Work Holding Specialist"—for complete information and service.

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of making three sets of tests cutting through the center of the weld, polishing and then etching in sulphuric acid which brings out the weld size, penetration and defects, if any, in the weld. These also must meet the Air Force requirements, which also will vary with stock thickness and material.

We perform all of the above plus making an etch sample and tensile sample, or peel test (whichever is required) of every piece welded.

In spot welding, the test would be either tensile shear or peel test. In seam welding we use a Marco or peel test. This is done above and beyond Air Force requirements and is performed on every piece upon completion of welding.

If the welding machine is functioning normally we'll get three positive results. If a fluke has developed, however, we need get only one negative result—in which case, the hot part which was completed just before our test run, would be rejected outright.

Once our test coupon passes the tensile tests, we then subject it to the second test, a Marco test. Here we cut a cross-section through the weld in the test coupon. Next, we etch it with sulphuric acid. Finally, the nugget is examined for maximum and minimum penetration. The Air Force specifies that the weld must make a maximum penetration-in-depth of 80%, and a minimum of 20%. To insure the highest quality, however, we have arbitrarily doubled these percentages, so that our test coupon must pass its Marco test with a maximum penetration of 60% and a minimum of 40%. If it does not show penetration within these limits, the part is rejected.

Throughout the fabrication, each weld stage includes test coupon runs

and thorough cleaning before the next stage. Once welding operations are completed, the after-burner liners are riveted in position. Then, when all operations are finished, the assembly is placed in the Eclipse annealing oven for about 120 minutes to accomplish age hardening. Only careful packing, under the supervision of the Inspection Department, and shipping remain.

Chief Villain

It is just before this point, however, that the final inspection of many companies turns up the chief villain in a Quality Control program: The faulty finished article, requiring rejection. This stage of inspection accounts for the cluttered appearance of scrapped parts around the "back doors" of so many plants. This is why we take such pride in our own Quality Control program at Portland Copper & Tank. In fact, we invite visitors in through the back door instead of the front, because our back yard is 100% clean.

As the final inspection of the total fabrication process, the Air Force requires that a completed after burner assembly be spot checked every 90 days. This involves ripping apart and checking every single part of the assembly. It is at this point that all the effort that has gone into the Quality Control program at Portland Copper & Tank pays off, for our rejection rate is very low.

When one considers all the variables that go into mass production in this age of high-speed operations, we feel that this is a somewhat unusual record. Yet the philosophy underlying the success of this program has been a simple belief at Portland, which is held by both management and our craftsmen. It boils down to this: "Get it right. The process may be slow, but get it right."

SANFORD SURFACE GRINDER MODEL MG

For Dry or Wet Grinding!
PRECISION . SPEED . SENSITIVITY

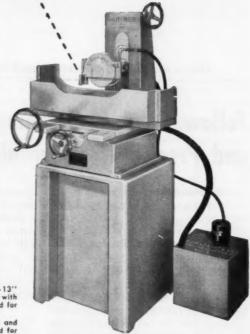
Built by manufacturers who concentrate on small grinders only, each Sanford Grinder is an individual project of time tested and proved basic design. Although modest in price, no quality undermining shortcuts are employed to reduce manufacturing costs. Constant repeat orders prove its acceptance.

This sensitive machine grinds to micro-inch accuracy with no vibration, with maximum dimensional stability. Here's why:

- Transverse ways are double Vee (VV) Meehanite inserts instead of flat surfaces which depend upon unstable jibs for alignment and accuracy.
- Needle, Ball and Oilite Anti-Friction bearings are used throughout.
- Alignments are electronically checked for accuracy.
- Precision slides are ground, lapped and hand spotted.
- Dials are large and legible.

SPECIFICATIONS _ 8¾' transverse - 13" longitudinal - 12" vertical under 7" wheel with Adapter. Approximate weight 630 lbs. Send for illustrated bulletin.

Replacement parts, special attachments and reconditioning facilities are available. Send for price list.



*With optional equipment



MANUFACTURING CORP.

1026 Commerce Ave., Union, N. J.

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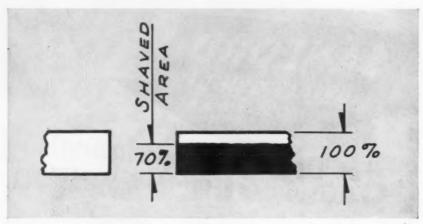


Figure 1

". . . there are no shortcuts to making shaving dies."

Follow Good Die Making Practice and Precise Workmanship

By **Paul Prikos**, Vice President Prikos & Becker Tool Co. Skokie, Illinois

Secondary Operation Shaving Dies

A DISCUSSION of shaving dies is necessarily one dealing with advanced and precision die making procedures. While many companies may make general dies (blanking, progressive and forming) few, by comparative numbers, can build shaving dies correctly. So many shaving die operations fail because their construction is akin to general die making practice. There are no short cuts to making a shaving die, they must be built according to the

general design discussed later and with precision workmanship.

At this point it is best to define certain terms so that no erroneous conclusions can be reached.

A. Shaving means that a die must be built which will remove a certain quantity of material from the edge of a piece part (usually a die-made blank). Invariably this shaved edge is used as a functional part where another part will contact it, for example, a cam-like surface. The same results can sometimes be achieved by grinding the edge surface. However, a die in operation is

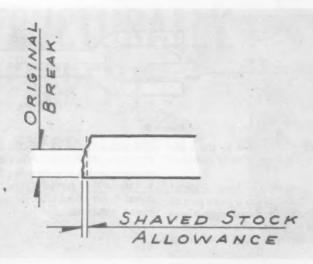


Figure 2

usually faster and the labor employed is cheaper. Furthermore, an irregular curving surface may be desired and grinding would involve form dressing, etc. Lastly, in shaving, every part is identically shaved, because the die once made, does not change, hence, the same measurements or readings on the part are always duplicated. This is not so likely in a grinding operation.

B. 1st Shave: Approximately 75% of all shaving dies made are in this category. Whenever 60 - 75% of an edge surface is desired to have a smoother finish, one shave operation is needed, figure 1.

C. 2nd Shave: Whenever 90% or better of an edge surface is desired to have a smooth finish, two shaving operations are required.

D. Shaving Finish: 16 micro inch finish (16 is all that can be guar-

anteed). The appearance will be very shiny (like a chrome-plated look).

A blank or piece part can be shaved all around the periphery or at certain areas only. The amount of stock removed will not exceed 10% of the stock thickness per side. Any amount in excess of this will be considered trimming. For soft steel use 6% of material thickness and for hard steel, 8% of stock thickness. Playing it safe by allowing more stock to be shaved will be disastrous, causing new break lines on the edge of the blank. Remember, you will be dealing in tenths and a few thousandths. For example, a part .050" thick and soft steel will have .003" allowed removable stock per side (.050"x6%= .003). We can appreciate why punch and die must be close fitting and of high precision quality. See figure 2 for shave edge clarification.

Usually a piece part drawing will indicate the area to be shaved by draw-

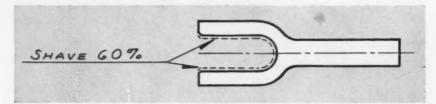


Figure 3

ing a dotted line parallel to the piece part outline, figure 3. This is common drafting practice.

Much discussion has been centered on the position in which a piece part to be shaved should be placed in the dieburr side up or down. The best practice is found in analyzing the position of a blank in a progressive, pierce, notch, shave, and blank die. Here the burr will always follow the punch, hence, the burr will face down on the die block if shaving is done in a secondary operation. However, it must be stated that some limited materials can be shaved in either burr direction with no resultant surface change whatsoever. One such material that comes to mind is INVARO, a softer type of material.

A shaving die is usually made of a H.C.H.C. material R.C. 60-62. It must be sectional in construction so that the cutting edges can be ground after heat treating to remove the soft surface of approximately .002" - .003" carborizing. Also, we grind after heat treating to ensure accuracy. The die blocks need not be extra heavy, 3/4" to 1" thick, but they must be yoked to avoid spreading. Remember, shaving creates tremendous side pressure caused by the resistance of the punch trying to slip away from biting a few thousandths material. The die blocks should be keyed and tight fitting in the yoke. The shaving punches must be heeled and their base should have an area in length of 1-½ times the length of the part. Heels on the punches should never be under ¾" thick. It is further advised that the dowel holes should be jig ground to ensure squareness for lineup.

The stripper is a conventional spring type with equalizing buttons on the bottom that will avoid cocking in case of dirt particles on the die or faulty resting of the piece part by the operation during production.

Locating the piece part on the die is usually done by locating pins and nests. We have found that while nests secured by the use of dowels and screws will suffice, another method is better. Generally speaking, nest plates are usually 1/8" or so thick, made of gage stock. The dowel pins that locate them do not have much bearing surface which is the inherent weakness. Nest plates made with a 1/4" x 1/4" tongue fitted into a ground groove in the die block, have superior bearing surface than dowels and withstand the terrific side pressure caused by the shaving action as explained before. See figure 4 for die construction details. Sometimes, nests are made integral with the die blocks, whenever there isn't enough room to permit screws or dowels. However, integral nests should be avoided at all costs, because the maintenance costs are increased due to the caution

STRUCTURALLY DIFFERENT...

REINFORCED RESINOSD BONDED
ABRASIVE CUTTING PARTICLES
AND FIBERS
SPIRAL SAFETY

REINFORCING FABRIC

WEB BACKING (AUTO TIRE CORD CONSTRUCTION)

FOR EXTRA STRENGTH
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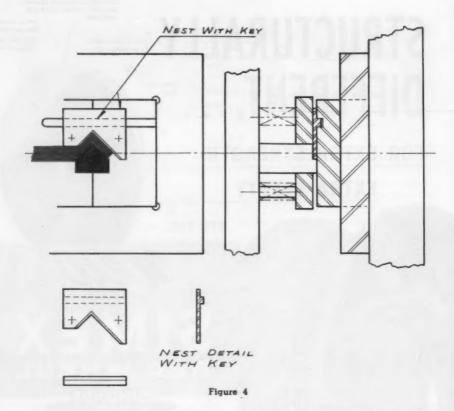
For rough, tough production grinding—welds, removing flash and bead; cleaning up rough ragged surfaces and edges. This new lightweight rigid type reinforced resinoid bonded abrasive wheel can give you sensational savings. Use Simex on portable disc type and right angle type portable grinders. Depressed center or raised hub shape; 7" and 9" diameter x 3/16" and 1/4" thickness.

SEND FOR BULLETIN ESA-244 AND LEARN HOW MUCH BETTER SIMEX IS FOR YOUR JOB



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Branch Warehouses: Besten, Detreit, Chicage, Partland, Sen Francisce - Distributors in Principal Cities
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Heller Teel Compeny, Newcomerstewn, Ohle, Simonds Canada Saw Co., Ltd., Montreal, Quebec,
Lion Grinding Wheels Div., Brockville, Ost. and Simonds Canada Abresive Co., Ltd., Arvide, Quebec



required by the diemaker when sharpening the die and avoiding grinding away the location surface of an integral nest and die block.

The punch and die should be slip fit members with no back taper in the die block. A slight back taper of a few tenths is permissible to permit some error allowance for the die maker.

Whenever a shaving die shaves a part of a blank on one side which is exceedingly precise, it is suggested that a tab be allowed on the opposite side of the shaving area to afford balance. Hence, in this way the piece part is

being contained by biting or cutting both sides of the blank, avoiding shifting and the consequential dulling of the punch edges, figure 5.

When a piece part is being shaved about its periphery, many designers are faced with the problem of having to push the blank into the die back opening. The construction of this type of a die involves an internal pad that delivers the piece part back to the surface. Sometimes the die is called a burnishing die. We try to avoid this construction because of the sliver problem usually encountered in trying to clean

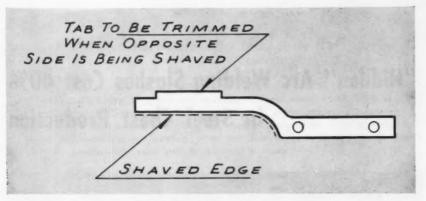


Figure 5

the die during production. Whenever possible, try to locate the part on firmer ground, namely, the die block which does not move. Accuracy is thus assured.

In conclusion, a few words should clarify the type of die set most shave dies require. When the diemaker has a selection, he should choose a precision steel set with a four leader pins set preferred. If a two post set is used for smaller parts, select a set with the center leader pins as opposed to back pin sets, namely through the center. This gives better bearing across the die set where the work is actually being performed. Also specify shoulder or extra long leader pin bushings to allow maximum bearing and rigidity.

The End

Flame-plating cuts sewing machine feed dog costs

Factory operators are cutting their sewing machine feed dog costs by as much as 70 per cent through the use of standard steel feed dogs Flame-Plated with a thin coating of tungsten carbide. The tungsten carbide coating, applied by Linde Air Products Company's Flame-Plating process, is claimed to extend the service life of standard steel feed dogs to as much as six times that of uncoated parts.

Tests by a leading sewing machine user have shown that steel feed dogs have an average life of about one month when used on highly abrasive materials such as burlap or canvas. Flame-Plated feed dogs, however, have given

The feed dog in this industrial sewing machine (cover plate removed) has been Flame-Plated with tungsten carbide.



as much as six months' service on the same materials.

"Hidden" Arc Welding Slashes Cost 40% In Steel Chest Production

MODERN design and modern production techniques are combined by Diebold, Inc. of Canton, Ohio, in streamlining the manufacture of its long established line of safes, strongboxes and steel chests. Recent changes to welded designs fabricated with automatic hidden arc welding have increased strength at overall cost savings of more than 35 percent.

Typical is the design change of chests to steel which has resulted in a cost saving on this product of 40 percent.

Chests are now manufactured from 1" steel plates which are burned out and fitted together in a fixture. A fast sealing bead is made manually, and the final weld is made using Lincoln Electric's automatic "Lincolnweld" hidden are process. The current setting is 1000 amps at 35 volts, with a speed of 12 inches per minute. The chests are then machined and hand finished.

The welded construction weighs considerably less than the previous design effecting a drastic saving—at the same time giving it greater strength and clean-cut, modern lines.

The welded design requires much less machining and finishing. It elimi-



This cast steel chest has been redesigned for welded construction at a saving in production costs of more than 35 per cent.

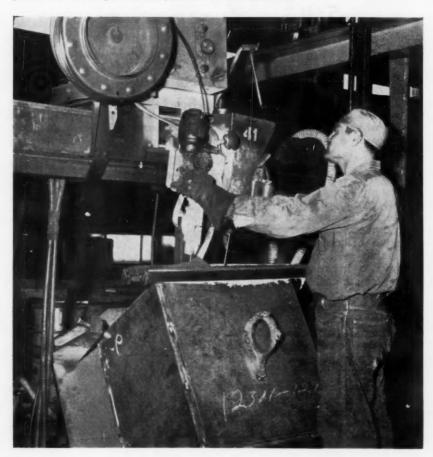
nates the costly, time-consuming job of removing small casting cracks and inclusions on the highly polished surface.

Similar cost savings were experienced when other of the company's products were designed for welded steel construction. A vault vestibule, complete with door jamb frame, when changed to welded construction, resulted in savings of more than 35 percent.

The End

. . . welded construction weighs less, costs less

After tack welding, the 1" plates are mounted in a positioner which holds the joint under a standard Lincolnweld head mounted on a self-propelled carriage. The head moves along the joint and when the weld is finished the chest is rotated and another joint positioned for welding. Note flux dam made to hold granular flux in position for covering the corner joint as the weld is made.



December, 1955

\$2,500.00

IN CASH PRIZES!

MACHINE and TOOL BLUE BOOK's

50th Anniversary

PRODUCTION CONTEST

Here's your opportunity to win \$1,000, \$500, \$300, \$200, or \$100 in cash prizes!! As a part of the 50th Anniversary of MACHINE and TOOL BLUE BOOK, which celebrates its 50th birthday in January, 1956, the BLUE BOOK will sponsor a production contest open to everyone in the metalworking industry.

Here's All You Do:

 Discuss in as many words as you need, any production technique or tooling idea or machining method used in your shop to increase production and/or cut costs. You'll merely want to describe the old method, the problem involved and the solution which answered the problem. Winners will be judged only on the job, or operation described and the savings which resulted.

	ST OF PRIZES	
1st Prize	\$1	,000
2nd Prize	S	500
3rd Prize	S	300
4th Prize	\$	200
5, 6, 7, 8	, 9th Prizes	
	each \$	100

- The article need not be well written so long as the facts are there. Entries should be accompanied by photos and/or drawings. Drawings or sketches can be rough, penciled ideas.
- Entries will not be judged on the basis of how well you write, draw, or how you present your material. The job is all that counts.

4. Attach an official contest blank to your entry and address it to: Contest Editor, MACHINE and TOOL BLUE BOOK, 222 E. Willow Ave., Wheaton, Ill. The entry blank appears on this page and will also be included in future issues of the BLUE BOOK. Additional copies of the entry blank will be sent on request.

5. Entries must be postmarked no later than January 31, 1956.

6. All entries become the property of Hitchcock Publishing Company. However, if any article does not win, and is still published in a Hitchcock publication, you will be paid regular contributor's rates for your material. So, you can't lose!

7. Judges will be announced later.

8. There's no limit to the number of entries made by one person.

You've done the job. Now write about it and win \$1,000 in cash!

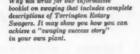
MACHINE and TOOL BLUE BOOK'S 50th Anniversary Production Contest OFFICIAL ENTRY BLANK

- Everyone is eligible except employees of Hitchcock Publishing Company and their families.
- Entry must discuss, in as many words as needed, a saving in cost, or time, made as result of an improved production technique or machining operation or tooling idea.
- Entries should be accompanied by photos and/or drawings to better portray the job.
- Contest opens November 1, 1955, closes February 1, 1956. All entries postmarked later than January 31, 1956, cannot be accepted.
- 5. The decisions of the judges are final.
- 6. In case of ties duplicate prizes will be awarded.
- 7. This contest is limited to residents of the continental United States.

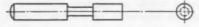
Name: ______
Company: ______
Home Address: ______
Business Address: ______



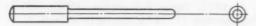
This finished piece used to be made on an automatic screw machine with the long, narrow diameter section turned to .100 ±.003 and a necessary sharp shoulder.



Why not write for our informative



Torrington's swaging experts suggested starting with this simple screw machine blank (to retain the required shoulder).



Result after one rotary swage—an improved finished piece, to a tolerance of ±.001.



THE TORRINGTON COMPANY

Swager Department 580 North Street, Torrington, Conn. Makers of Torrington Needle Bearings

See what savings you can make by swaging

- 1. Saving in material—swaging uses nearly all the metal.
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- 3. Saving in labor—unskilled labor can run a swager.
- Saving in machining—swaging produces finishes accurate to ±.001.
- Saving in finishing operations—swaging produces high finish, better hardness and resiliency.

TORRINGTON SWAGING MACHINES

Encircle No. 297 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

Shop HINTS



Special End Mills Standardized

by Edward McIntyre

Any standard end mill purchased from a catalog is standard only as long as application without alteration is permissible. The moment it is altered it no longer can be called out safely by processing. It follows then that identification is the next sequence of tool control.

To identify this altered end mill with a tool number relegates the tool to a specific job on an individual part and operation number. A design is made showing the standard tool plus alteration and T-number identification.

Unless T-number tools are crossindexed in some fashion to the standard purchased item from which they were made, their availability for future application is lost. As a consequence your tool cribs may be greatly overstocked

OOL NO.	DIA.	RADIUS	No. OF FLITTE	SINGLE OR DOUBLE	KIND	HAND	LENGTH	HEAT TREAT	
M-9000	5/8"	.031	4	SINGLE	H.S.S.	R.H.	STD.	HEAT INCH!	
M-9001	1/8"	.010005	2	SINGLE	H.S.S.	R.H.	STO.		
M-9002	1/32	.03/	4	SINGLE	H.S.S.	R.H.	STD.		
M-9003	1/4"	.000	4	DOUBLE	H.S.S.	R.H.	STO.	NITRIDE	
M-9004	1/4"	.000	4	DOUBLE	H.SS.	L.H.	STO.	NITRIDE	
M-9005	5/16"	.000	4	DOUBLE	H-S.S.	R.H.	STD.	NITRIDE	
M-9006	1/0"	.010-005	4	SINGLE	H.5.S.	R.H.	570.		
M-9010	9/32"	.03/	4	SINGLE	H.S.S.	R.H.	STO	STD	
M-9012	774	000	4	SINGLE	H.S.S.	R.H.	STD.		
M-9013	609	.000	2	SINGLE	H.55.	R.H.	STD.		
M-9014	3/8"	.093	4	SINGLE	H.S.S.	R.H.	LONG		
M-9015	3/8"	3/16 BACK	2	DOUBLE	H.S.S.	R.H.	STD.		
M-9016	5/16"	SOUTH ANGLE	4	DOUBLE	4.5.5.	R.H.	370.		
M-9017	3/8"	3/64"	4	SINGLE	H.S.S.	R.H.	LONG		
M-9018	17/32"	1/32" R	2	SINGLE	H.S.S.	R.H.	STO.		
11-9019	3/4"	.062	2	SINGLE	H.S.S.	R.H.	STO.		
M-9020	3/4"	1/16"	4	SINGLE	H.5.5.	R.H.	STD.		
11-9021	3/4"	1/8"	4	SINGLE	H.SS.	R.H.	STO.		
M-9022	3/4"	1/32"	4	SINGLE	H.S.S.	R.H.	STD.		
M-9023		.015	4	SINGLE	H.S.S.	R.H.	STO.		
M-9024	1"	3/32"	4	SINGLE	H.S.S.	R.H.	STO.		
M-9025	14	7/32	2	SINGLE	H.S.S.	R.H.	STD.		
M-9026	1.173	.000	2	SINGLE	H.55.	R.H.	STO.		

Shop Hints

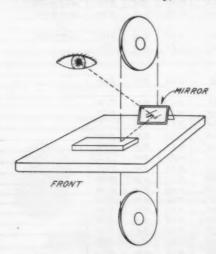
with duplicate end mills and orders for new duplications in the making.

This chart removes the necessity of designing a picture for each end mill. It places these standardized end mills at finger-tip availability, from the new to the worn out tool. Failure to channel these "special purpose, standard tools" back into active production through a method of standardization is a costly oversight.

Mirror aids in filing

by E. J. Urbas

When filing a die section to a layout line the visibility of the line is good on a reciprocating or band filing machine. However, when attempting to file a die section that requires a taper within a given amount of the cutting edge a problem arises on how to see the filing from behind the machine. This problem also arises when filing a sheared die section, that is, when the punch is sheared into the die block to transfer its outline. Naturally, in this



REFLECTION OF FILING SHOWING WHAT IS OCCURING FROM AN INVSABLE ANGLE.

type of procedure there are no layout lines on the die block to file to. This type of filing can only be observed from the rear of the machine.

The next time this condition arises, take a small mirror and mount it on a simple wire stand in order to hold the mirror upright and place it on the table behind the file. This will enable you to see "behind the machine" while you stand in the normal position in front.

Try a saw-tooth cutter by Harold D. Rhodenbaugh

Did you ever try plunge forming a profile or spherical radius on aluminum extruded stock in a screw machine? The machine rises right up and snarls at you. It sets up vibrations that threaten

TOP VIEW

to loosen up every stud and bolt. It pounds until nearby machine operators raise their heads in scowling protest. The interrupted cuts pound the form tool with terrific impact, loading and dulling the cutting edge.

Pre-cutting through the extrusions with a saw-tooth cutter will greatly reduce shock and wear on the finish form tool; will add tool life and retard loading or build-up along the cutting edge.

There are no critical dimensions to consider in making this tool. Consider the width of the form and cutting geometry only. Irregularity of tooth profile does not impede its function. Depth of tooth or root and number of teeth is optional, but may be considered in relation to depth of extrusion. Let this tool take the punishment and load from the more expensive form tool.



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Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio. Remember—only CINCINNATI Grinding Wheels give you . . .

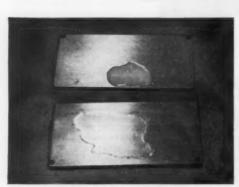


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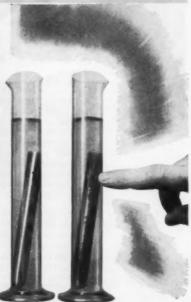


Announcing SHELL DROMUS OIL E



Above: Cooling action of a cutting fluid is directly related to its wetting ability. Conventional soluble oil emulsion (background) "balls" up. Equal amount of Shell Dromus Oil E spreads out thinly... wets far greater area.

Right: Plain carbon steel, if left in water at room temperature for about two hours, will rust as shown. Sample on left was in a 1-30 solution of Shell Dromus Oil E and water for six months without rusting.





NEW CUTTING OIL

permits higher speeds and faster feeds than ever maintained before

Shell Dromus Oil E, a new solution-type fluid, wets all metal surfaces with extreme rapidity and keeps both work and tools exceptionally cool. These qualities permit an increase of machine speeds and/or feeds far beyond anything allowable with conventional soluble oils.

IT'S MUCH EASIER ON TOOLS

There's much more life in any cutter or abrasive wheel when protected by this new oil. It stays put between tool and work. (At a 1-30 dilution, average tool life increase in extended field tests was about 50%.)

IT FIGHTS RUST

Shell Dromus Oil E is readily soluble in hot, cold, soft or hard water, and stable in any concentration. Even at low concentrations, it gives excellent rust protection to all ferrous metals, including cast iron.

IT KEEPS WORK COOL

Even at stepped-up production rates, you'll find less heating and better finish wherever this new oil is used.

IT SETTLES OUT FAST

Chips and wheel particles settle out immediately . . . the recirculated fluid is clean and free from contaminating particles. It is *not* sticky or greasy . . . leaves no deposits on machines or work.

IT'S GREAT FOR GRINDING

Grinding wheels remain clean, even when material retains a film of cutting oil from a previous operation. Even cast iron can be ground cleanly when Shell Dromus Oil E is used to cool the work.

If all this reads "too good to be true," we suggest that you try Shell Dromus Oil E, on any problem operation you have. It is that good!

SHELL OIL COMPANY

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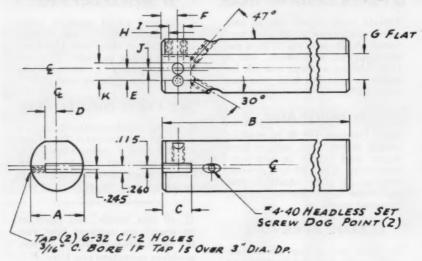
Trepan from the Hex

by Edward McIntyre

Trepan operations on hand screw machines are, more often than not, assigned to front or rear tool post positions on the cross-slide. Where tight finishes are required on difficult-to-machine materials, this is sound practice. However, to consider this the rule rather than the exception is debatable. Time and motion study proves that higher production is realized when machining operations can be executed from the hexicon turret. More thought and effort must be concentrated on

tooling the hex turret if cost reduction is to be fully realized.

Figure No. 1 pictures a trepan tool holder. Figure No. 2 shows the cutter. This tool, mounted in a vertical slide tool holder in the hex turret, will execute a trepanning operation in less time than that required to maneuver the cross-slide into a cutting position. The cutting tool shown in figure No. 2 was designed and standardized to trepan aluminum end plates. Operating time was better than sixty percent



TREPAN TOOL HOLDERS

TOOL NO.	A	B	C	D	E	F	G	H	1	J	K	TREPAN TOOL NO.
WS -5370	1"	6"	1/2"	1/4"	1/4"	1/4"	1/2"	18	18"	٤	5/16	WS-537/
WS-5370-01	1/2"	6"	1/2"	٤	1/2"	1/4"	1/2"	1/8"	1/8"	1/4"	5/16"	,

F16.1

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NO. 5 OF A SERIES ON THE HISTORY OF ABRASIVES BY CHICAGO WHEEL & MFG. CO.

'The glory that was Rome' is debatable among historians. Surprisingly, Rome is more often remembered for its decline and fall than for its accomplishments. However, all agree the Romans were great builders. Their temples, villas, arenas, and triumphal arches testify to this. In building construction as well as in the weapons of war, abrasives and grinding played a

JN THE DAYS of the Empire, the principal building materials were stone, brick and cement. For the more important buildings slabs of marble were laid over the rough structure. The removing of burns on stone, the smoothing of mortar and the grinding and polishing of marble was done with abrasive rock, sandstone and pumice.

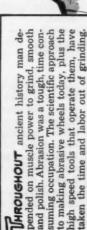






and leather, and carried iron decorated shields, iron NEV TO ROMAN CONQUESTS were the tireless Legionnaires. These foot soldiers wore cuirasses of iron equipment was kept polished and sharp, and each legion lipped javelins and the famous Roman short sword. All had its allotment of grinding and polishing stones.

Pliny and Lucian wrote of metal mirrors, made of a mixture of copper and tin, which required frequent grinding to enhance their reflective quality. For this purpose a sponge full of powdered pumice-stone was BRASIVES were common to the Roman home. often kept hanging near the mirror.





There is no variance from one production run to another. In other words, if you used a particular A new factor in the manufacturing of mounted wheels and points is Chicago Wheel's positive production control. This means mounted wheels and points can now be produced alike in every detail. wheel type for a job one month ago and now want another order, the new wheels will be exactly the same. You can imagine the advantage here in production grinding.



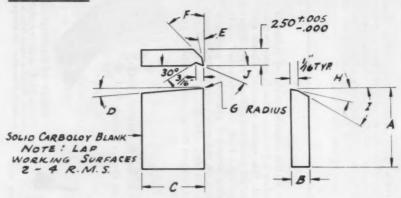


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TREPAN CUTTERS - ROUGHER

	883 350			-	-	-	-	-				91
700L NO.	883	350								H	1	J
WS-537/	-01		1"	7/32	3/4"	30	100	18°	.000	120	180	12°

F16.2

faster from the cross-slide. Scrap due to operator error on this operation was reduced to zero.

Another application of the bar in figure No. 1 is that of deep hole boring to wide bottom shoulders beyond the range of standard boring bars. In most cases this bar eliminates boring to depth and generating to face the shoulder. The operation is simplified by boring in and plunge facing the shoulder to depth. The cutters shown in figure No. 2 are made from standard carbide blanks generally stocked as standard items in most tool cribs or central stores.

Compensating Universal Chuck Mounting

by H. J. Gerber

Most universal chucks will never hold work to dead true rotational accuracy. This lack of accuracy becomes more pronounced as the scroll and jaws wear through normal usage. It is not at all a difficult matter to build a special back plate mounting for any universal chuck to permit the chuck to be adjusted for dead true accuracy for unusual requirements.

The sketch shows the floating two-

piece back plate which can be adjusted after the work is locked in the chuck jaws. The adjustment is made through the three cone pointed set screws C which are threaded through plate B and contact the lathe spindle nose adaptor A. Adjustment is made to a dial indicator which is in contact with the work.

Plate B is permanently secured to the chuck by four Allen cap screws E. This

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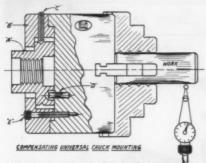
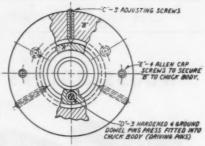


plate is machined also to fit the recess normally found in the back surface of the chuck body. The cone pointed screws C are seated into an angular groove machined into the periphery of spindle nose adaptor A.

The driving torque between adaptor



VIEW FROM REAR OF BACK PLATE

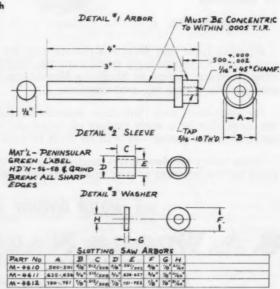
A and the chuck body is taken up by three hardened dowel pins D which are pressed into holes drilled and reamed into the chuck body. These pins are loosely fitted into oversize holes in matching position in nose adaptor A to allow freedom of movement during adjustment.

It's a One Print Deal

by Harold D. Rhodenbaugh

Job shops and small production shops often find themselves in the position of paying drafting fees over and over again for duplicate design with minor dimensional changes. A little thought given to print tabulation will reduce this cost and will, upon occasion, expedite the tool.

Illustration shows a method of design and control of slotting saw arbors for Nichols hand mills. Here we have one tabulated design covering three different size arbors and their details. If these arbors were drawn up individually and uncontrolled, the





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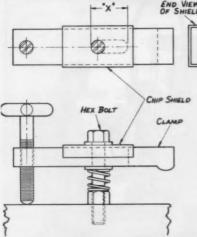
company would be paying for nine duplicate designs.

This method of design will cover many more arbors of similar design by writing in tabulated dimensions and the annual savings can be marked up on the profit side of the ledger.

Chip shield

by F. A. Adams

When using a clamp such as shown in the illustration, the problem of chip clogging frequently makes the clamping operation rather difficult. In order to remedy this problem, we put a chip



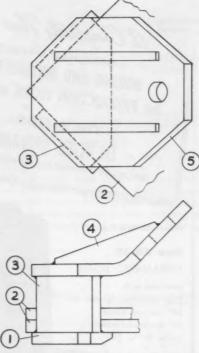
shield on top of the clamp as shown. This shield covers the elongated slot "X" in the clamp, making it impossible for chips to become lodged between the bolt and the end of the slot.

Self-centering plate hooks for safety

by Fred Boston

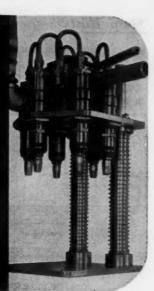
The customarily used plate hooks are inserted under the plates that are to be lifted, approximately in the center of two opposite sides.

Not only is it difficult to find the



correct location for the hooks without measuring, but the plates, when being lifted, have been known to slide off and present a safety hazard. To overcome this difficulty, corner clamps as shown here can be used with good results in many cases: Top plate 5, reinforced by gusset 4 is welded to two uprights 3 which, in turn, are welded to the bottom plate 1. The bottom plate is chamfered to facilitate insertion beneath plates 2 that are to be lifted. Top plate 5 is provided with a hole for the chain.

Two such corner clamps, combined in a sling, will automatically find the center of gravity of any rectangular plate or stack of plates. BUCKEYE multiple-unit fastening and drilling tools reduce assembly time and costs on any operation involving two or more fasteners.



Now—an entire assembly operation, where two or more fasteners are used, can be completed in the same time required to drive a single fastener. The savings you can make will increase directly with the number of tools in your Buckeye multiple-unit tool. You decide how many screws or nuts you wish to drive—simultaneously . . . or how many holes you want to drill—simultaneously . . . you're limited only by the air supply available in your plant.

Tools can be positioned to match any horizontal drilling or fastening pattern, and to compensate for any differences in vertical position of screws, nuts or workpiece. A Buckeye multiple-unit tool will drive screws and nuts of different sizes and types . . . will drill holes of different sizes and depths—and do either job simultaneously. Tool capacities, in multiple units, are identical to individual tool capacities.

Buckeye multiple-unit fastening and drilling tools are engineered to your specific requirements. They may be arranged on self-supporting arms, as illustrated, or designed for suspension above the work. Just send a letter or sketch, outlining your assembly operation, or ask to have a Buckeye Tools Sales Engineer visit you, Either way, it costs you nothing to learn how you can step up assembly output and cut assembly costs—simultaneously.

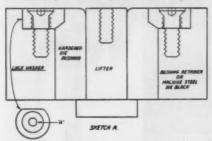


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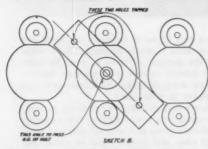
Washer removed with bolt

by Ernest Pochervina

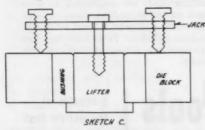
When using lock washers as shown in sketch, it is to your advantage to



thread the center hole of washer so that in case of damage around bushing re-



tainer you may be able to pull out the locking washer with a bolt. Dimension



A would be large enough to pass over od of bolt and be tapped out to next size bolt. (Ex: 5/16 uss bolt, A = 21/64

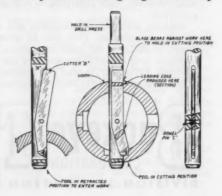
and tapped out for a % uss bolt.)

You will note lifter is also tapped out, which helps to pull bushing from retainer (or machine steel die block). After pulling lock washers, if you wish to pull die bushing, screw a bolt into the threaded hole of lifter and bushing can be pulled. If needed, you can make a jack to remove bushing plus lifter.

Internal counterboring tool By Paul Bergstrom

A quantity of tubular bronze castings were to be drilled with a series of holes diametrically through the casting and spaced 90 degrees apart. These holes had to be counterbored on the inside of the tube so that fins could be attached on the outside by socket head fillister screws inserted and seated on the inside of the tube. The difficult back counterboring operation was easily and quickly accomplished by the simple two-piece tool illustrated.

A shank A was slotted centrally to receive the hardened and ground tool steel blade B. This blade was pivoted on a hardened dowel pin C. As tool is fed into the work through the hole on the top side of the tube the radiused and polished leading edge of the top



half of the cutter B bears against the side of the hole and swings the blade B

into cutting position.

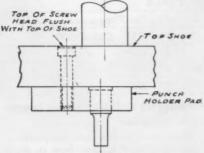
This radiused edge of the blade continues to bear on the side of this hole in order to hold the blade in position until the counterbore is completed to depth. The spindle of the drill press is raised and the tool is retracted into the slot in the body to allow it to be removed. The work is then rotated to the next hole and the operation repeated.

This tool is not universal and its dimensions depend upon the body diameter of the workpiece on which it is to be used.

Simple method prevents screw backoff

by Roger leetts

When making dies of all types, and particularly dies that receive a lot of shock and vibration during operation, it's a good idea to screw all punches, holders, etc., to the top shoe from the

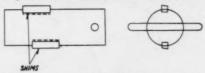


back side. That is, counterbore the top shoe the same depth as the thickness of the screw head, so that the head is flush with the top of the shoe. Since the top shoe is backed up by the press ram, this method will prevent the screws from backing off or becoming loose during operation, thus preventing serious injury or costly damage to the die.

Emergency reamer for large holes

By Federico Strasser

For enlarging good-sized bores with somewhat smaller diameter than the required dimensions, one may utilize a



wooden arbor (with a diameter smooth fitting to the existing hole) having one or two steel bits inserted. A strong bar is used as driving handle. For diameter variations employ thin shims under the toolbits.

V-block reference point locator

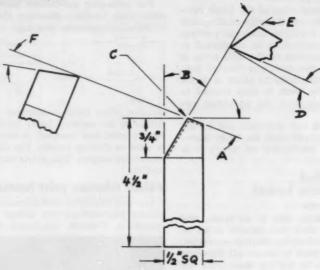
Lay-out problems that normally complicate pipe-cutting are solved by an ingenious V-block. Equipped with a



protractor, levelling bubble and prick punch, the block enables its user to lay out any precision reference point on horizontal pipe. Designer Charles Gonday is shown preparing to mark a point some 17 degrees off the centerline.

Production Chamfer Tools

by Edward McIntyre



KNEE - CHAMFER TOOLS

TOOL NUMBER	A	B	C	D	E	F	To P	RODUCE
WS-6000	20°	60°	.000	70	7°	7°	45°	CHAMFER
WS -6001	20°	75°	.000	7°	7°	7°	60°	
WS-6002	20°	90°	.000	7.	7°	7°	75°	*
WS-6003	20°	45°	.000	7.	7°	7°	30°	

In hand screw machine work chamfering is one of the most common operations. Therefore, it is advantageous to have a series of tools made up and identified to produce your particular requirements.

Illustration shows a series of four of the most common chamfer tools. These tools were designed for use on the hexagon turret in a standard Warner and Swasey, knee tool holder M1863. When tooling for production it is always well to consider the hexagon turret first for production tool stations.

Breaking oil seals with rubber bumper by E. Pochervina

Toolmakers at times are hampered by the slug from a pierced hole in sheet metal or brass being held to the face of punch either by slight magnetism or an oil film. This may be overcome by drilling a hole into center of punch and inserting a piece of rubber. Size of hole is determined by size and shape of punch.

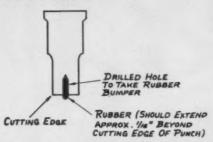
This idea can also be of use when slugs come back up out of die block.

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cutting fluid

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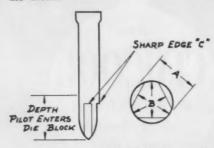


The rubber can be lengthened slightly and after slug is pierced the rubber will push slug deeper into taper of die.

Pilots reduce outward pressure on die block

by Ernest Pochervina

Design pilots as illustrated so that in case of mishit the excess metal being extruded into die block does not explode die block.



A is diameter required to pilot stock correctly. B is determined by A and gauge of stock.

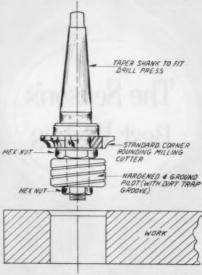
Example: Material .060, A = .500. In this case B would be .500 less .060. Total B= .440.

When mishit is made with pilot like this, sharp edge C cuts off the metal. Pilot reduces pressure (outward) on die block by 50% on mishit.

Milling cutter used for drill press corner rounding tool

by H. J. Gerber

A common corner rounding milling machine cutter can be easily adapted to make an efficient tool for cutting a radius on the edge of a hole. The tool is constructed much on the order of a counterbore. The cutter is keyed to a tapered shank, to fit the socket of the drill press. The extended shank



of the arbor is threaded below the cutter and a nut is drawn up tight on this thread to lock the cutter in place. Below this nut is placed a hardened and ground pilot which is made to the proper diameter for a running fit in the hole being radiused. This pilot is also secured by a nut screwed on the threaded end of the arbor. It is a good idea to provide the hardened pilot with a helical groove which serves the dual purpose of a lubrication channel and dirt trap groove.



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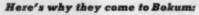
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STYLE A for general boring

STYLE B

SITUL A



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Cat. CT-500 Short neck carbide-tipped boring tools

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Cat. B-CH Back chamfering tools

Cat. O-R O-Ring grooving tools

Cat. R-R Retaining ring grooving tools



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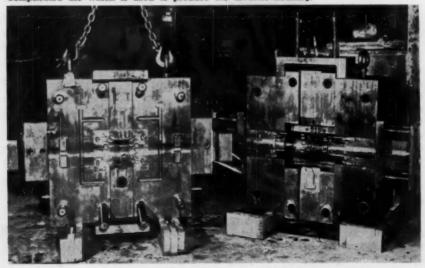
Magnesium Die Casting Saves 54% on Cost of Aircraft Inverter Housing

In designing a new model of its a-c/d-c inverter, engineers of Jack & Heintz, Inc., Cleveland, were aware that production of magnesium sand cast housings had been rather costly. Consequently, in cooperation with a job shop die caster, they redesigned the housing for their model F317 inverter to a magnesium die casting, with a

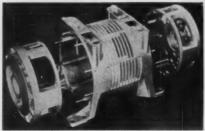
resulting cost saving of about 54 percent.

Inverters on aircraft are used to convert the available direct current to alternating current for powering much of the auxiliary equipment. The inverter must be lightweight, cool-running, and require minimal maintenance.

Complicated die which is used to produce the inverter housing.



Modern Tools



Housing for F137 inverter is die cast magnesium. Note thin wall sections and allaround ribbing which keep weight down and maintain cool operation.

Magnesium alloy was specified primarily because of the weight factor—2/3 of aluminum, ¼ of zinc or steel. Die casting was specified because it permits intricate coring and produces close tolerance parts. The largest magnesium die casting machine in the country is used to produce the housing, which is completely ribbed around its central portion.

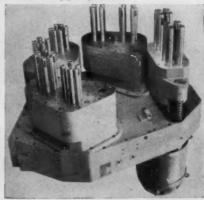


A typical installation of F137 inverter is adjacent to the cargo entrance of the Air Force's giant Douglas C124 Globemaster. J & H field man and Douglas Aircraft Company representative check installation of two inverters.

Reaming, Chamfering and Lead Screw Tapping Head

United States Drill Head Co., Dept. D, 616 Burns St., Cincinnati, Ohio, has recently designed and manufactured for a machine tool builder a special 41-spindle head consisting of a master drive box (which operates in horizontal position, is mounted and keyed on a hydraulic slide), 11 spindle pot head for drilling, 11-spindle pot head for chamfering, 11-spindle pot head for reaming, and 8-spindle individual lead screw pot head for tapping ½"-20 holes in steel forging.

The three pot heads for drilling, chamfering and reaming are driven through the master drive box by a 15 hp motor through a flexible coupling.



The motor in this case is mounted on the hydraulic slide. Two wing brackets,



The Empire Floating Tool Holder automatically compensates for BOTH angular and parallel misalignment. Sleeve and shank float independently of each other... achieving a free and easy movement... exclusive with Empire. Amount of float is infinitely adjustable. Minimum maintenance—holder has only five parts. Moving parts ride on rollers for smoother running with perfect alignment... and anti-friction of members. Bell mouths and over-sized holes eliminated, allowing for extremely close tolerance work.

Taps float IN and OUT with the Empire Floating Tap Holder. Designed to prevent freezing under tension caused by drag on the tap. Automatically corrects parallel and angular misalignment. Simple adjustment of locknut provides accurate control of wide range of float. Flotation makes close tolerances easy to hold. No spring or pivot members to restrict float. Available with straight or tapered shanks.

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DETROIT 13, MICHIGAN

Modern Tools

also mounted on the hydraulic slide, are bolted to the rear face of the master drive box. Head operates in conjunction with a 5-station trunnion type fixture.

Jet type oil lubrication is furnished for the main box and the three pot heads for drilling, reaming and chamfering. Grease lubrication is furnished for the lead screw tapping pot head.

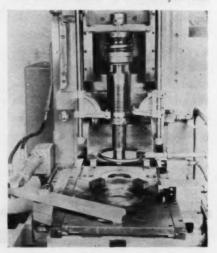
After energizing the start cycle button and with the drilling, chamfering and reaming spindles rotating, the hydraulic slide with the head moves forward and into its feeding stroke. The lead screw portion of this special head has not at this point started its cycle. The forward portion of the lead screw spindle pot head comes to rest and locates on the main trunnion fixture frame. The forward motion of the hydraulic slide trips an electrical contact switch which starts the tapping motor. While the eight individual lead screw tapping spindles are moving forward and returning individually in the tapping pot head, the drilling, chamfering and reaming pot heads are performing their operations with the forward motion of the hydraulic slide. The individual lead screw tapping pot head will complete its operation and the motor stop by means of the zero speed plugging switch before the main hydraulic slide starts its return stroke.

Following the tripping of the switch by the hydraulic slide, with the individual lead screw pot head at rest, the spindles proceed in a clockwise manner and in the direction of the workpiece. After the spindles reach their proper depth and complete their tapping operation, the rotary limit switch plugs the motor and reverses the entire tapping spindle. The spindles reverse in a counter-clockwise manner and return to their original positions. At the end of the reverse stroke the zero speed plugging switch plugs the motor and as the motor speed drops to zero speed, the current is shut off.

Loading, unloading device boosts automotive ring gear output

A simple loading and unloading device added to a standard Colonial RD 15-24 pull-down machine, used to broach inside diameters of automobile differential ring gear blanks, has resulted in a production rate of 300 gear blanks per hour.

A hydraulically driven, shuttle-type loading fixture was devised and mounted on the work holding platen. No auxiliary part-holding clamps were necessary. The shuttling fixture only locates the part with respect to the broach. Machine and fixture cycle are



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"You can't beat 'em for fast set-ups—they line up a job automatically under load even if your spindles are off-center as much as $\frac{1}{32}$ "— and you can't hardly wear 'em out. Those holders are really BUILT!"

Try one for a month—on open account—give it a real workout. Then if you want to send it back it hasn't cost you a cent.

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1546 E. NINE MILE ROAD, DETROIT 20, MICH.

Modern Tools

interlocked for automatic operation.

Operating cycle for this operation consists of: (1) loading the part in the fixture in the retracted position; (2) energizing the cycle and moving the loaded fixture into broaching position; (3) starting broach downward stroke, engaging workstroke puller, disengag-

ing from automatic broach return puller and making the cutting stroke; (4) shuttling the fixture into unloading and loading position as broach is returned. Entire cycle, including manual loading and unloading, requires only 12 seconds. Colonial Broach & Machine Co., Box 37, Harper Station, Dept. JS, Detroit 13, Mich.

Bearing Cap Broach Life Increased, Over-all Costs Reduced

Shifting to cemented carbide-tipped broaches recently increased bearing cap broach life at Studebaker-Packard Corp., South Bend, Ind., by 2500 per cent, and reduced over-all costs as well.

Broaching automobile bearing caps, like most broaching operations. is fairly tough on tools. The job is further complicated by the work material, highly abrasive cast iron with a sandy surface condition. Conventional broaches simply do not have a high enough abrasion resistance to combat the sandy surfaces.

Work is done on a Cincinnati vertical broaching machine with 2 rams. Speed is 28 sfpm, chip load per tooth 0.005" for roughing and 0.0015" for finishing.

Special round, push type 3-section broaches are employed on the standard machine setup. Each broach section has 12 teeth, and in operation only half the diameter contacts the part, thus 2 settings of the broach are made before removing for resharpening.

The former conventional broach operated a maximum of 24 hours, and sometimes failed completely after 1½ hours. Maximum production was 3600 parts. After tipping with Carboloy Grade 883

cemented carbide, the initial broach ran 50 days on continuous production on 12-hour operating cycle, producing 90,000 parts on one setting without any service needed. Subsequent runs have consistently exceeded the initial performance.

Work-holding fixture in open position shows work, upper right, and exposes flat and round broaches, used to perform both flat surface and radius cutting simultaneously.



MACHINE and TOOL BLUE BOOK

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Brown & Sharpe
Grinders get by
production when
modernized with
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ROUTE 6 AND NEW BRITAIN AVE., FARMINGTON, CONN.

Encircle No. 310 on Card, Opposite Page 65

Conversion Attachment Makes Standard Lathe Automatic

The Man-Au-Trol conversion attachment makes the standard Bullard vertical turret lathe completely automatic in operation for high production work.



The machining of an aluminum alloy compressor housing (22 individual operations) had presented several difficult tooling problems. They were solved through the use of the 26" machine's regular 5-position indexing head plus



a 4-position side head.

Heart of the Man-Au-Trol unit is the function or program control drum, which provides 49 possible changes of pre-selected operations in a machining cycle, controlling table speeds, feeds, head travel (feed or traverse), turret indexing, and engagement of other heads or attachments. The Bullard Co., Bridgeport, Conn.

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JIG AND FIXTURE COMPONENTS FOR INSTRUMENT TOOLING

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- Knurled Swivel Nuts
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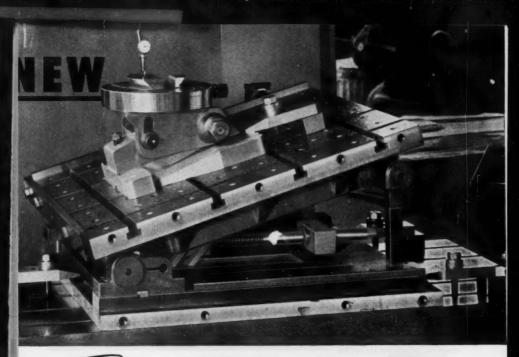
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CATALOG



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In addition to the sturdy construction of these units, and to eliminate any possibility of dimensional inaccuracies due to distortion, gauge blocks are inserted at each side of the Sine Plate. Top plate is raised and lowered by a simple screw-type mechanism . . . positioning is simple, safe, sure.

Two of these Sine Plates used in combination also answer the need for any compound angle.

Complete information on these new extra-large Sine Plates or models built to specifications will gladly be forwarded upon your request.

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Modern Tools

Sealant Keeps Moisture out of Plastic Dies

Foundry supervisors at Temco Aircraft Corp., Dallas, Texas, recently found the answer to the difficult plastic diemaking problem of locating a satisfactory sealant to prevent moisture in plaster casts from seeping into freshly poured plastic. They found that the paint shop's strippable protective coating for aluminum aircraft assemblies made an ideal sealant.

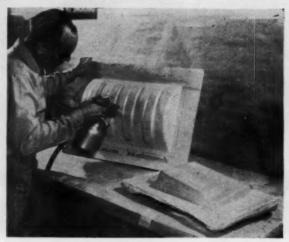
It allowed foundry men to work with fresh

plaster splashes, and cut one to two days off the time required to produce

a plastic die.

This trace is harmless until plastic is poured into the mold to form the die, and a chemical accelerator added. The accelerator—usually peroxide, or hydrochloric acid—causes the plastic to heat to about 200° F for a few minutes' time. This heat vaporizes moisture in the plaster, causing pits and other imperfections in the soft plastic. Pits often were ½" deep.

Temco adopted a sealing procedure that fenced off some of the bubbles from the plastic, but it was more tedious than effective. The mold first was dried for eight hours, then it was sprayed with a coat of sanding sealer lacquer and sand-papered. Seven more coats of lacquer were applied and sand-papered before the mold was ready for service. An average of 150 sheets of No. 400 sanding paper was used daily.



Foundry leadman Rankin H. Mayne, searching for a better method, started to investigate a protective coating he'd seen on new automobile chrome. He was reminded that a similar solution was used in the company's paint shop. This turned out to be Delco Chemicals' X-2000 strippable coating.

It is a vinyl-based coating which is sprayed on aluminum sheet stock to protect it during handling, forming and riveting. Used on plaster molds it makes a tough, quick-drying seal of about 1-

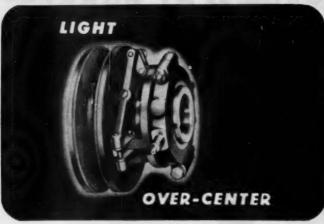
mil thickness.

Mayne discovered the coating could be used in the foundry in the same form it is used in the paint shop—cut with 20-30 per cent Methyl Ethyl Ketone or Methyl Isobutyl Ketone.

Foundry workers now spray one coat of sealer on each mold. They sand lightly, after the coating has dried, then they give the sanded surface a coat of wax. The mold then is ready for use.

The End

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TYPE shown above for grooves down to .375".

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Technical BOOKS

Elements of Machine Design

By Emanuel Rosenthal and George P. Bischof; published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36; 234 pp.; price \$4.50.

Here the theory of machine design has been simplified to meet the needs of students in technical institutes, technical high schools, and trade schools. Beginning with a survey of the metals of industry and their properties, the authors then discuss problems in applied mechanics, power transmission, and design stresses for dynamic loadings. The main portion of the book is devoted to the design of principal machine parts—shafts, keys, gears, couplings, bearings, pulleys, clutches, and springs.

The text is based on the problem approach to learning. A problem is posed for a particular topic, analyzed, and a solution presented. At the end of each chapter a set of appropriate practical problems is presented.

Engineering Mechanics, Second Edition

By Archie Higdon and William B. Stiles, in collaboration with Arthur W. Davis and Herbert O. Ustrud; published by Prentice-Hall, Inc., 70 Fifth Ave., New York; 585 pp.; price \$7.95.

In this book the authors attempt to keep student attention focused on mechanics as a prelude to design. They adhere to the common practice of freely using values for weights, dimensions, forces and angles that simplify the numerical work involved, in the belief that the time saved can better be employed in solving more problems and gaining a better mastery of principles and their applications.

In this second edition, chapters 2 and 4 on resultants and equilibrium have



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Full Ball Bearing Construction

- greatest flexibility in drilling irregularly spaced holes
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- 20 Standard Models-3 to 8 Spindles
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High speed grinding with small wheels was a Madison-Kipp development of the late twenties. It was born out of a pressing need in our tool room. Because tool room grinding problems are universal, we believe it will pay you to utilize Kipp grinders in your tool room as generally as we do in our own.



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207 Waubesa St., Madison 10, Wis., U.S.A. Encircle No. 316 on Card, Opposite Page 65 been reorganized and modified to reduce the number of types of force systems discussed separately. Bow's notation for graphical solutions has been placed in a separate article for convenient reference.

The free body concept is recognized by the authors as a powerful tool to aid the student and is emphasized throughout the remainder of the text after its introduction in chapter 4.

A discussion of the location of the centroid and the determination of the second moment of structural shapes has been added, together with an article on the use of Mohr's circle for principle moments of inertia of areas. A chapter on the use of virtual work in equilibrium has been added. Approximately 40 per cent of the problems have been replaced, and the total number of problems has been increased.

Helical Spring Tables

By John D. Gayer and Paul H. Stone, Jr.; published by The Industrial Press, 93 Worth St., New York 13; price \$5.

This book makes it quicker, easier and simpler to design and specify springs to meet your requirements. It provides:

 An easy to use index of over 6800 ready-designed compression and tension springs from which selections may be made to meet a wide range of design requirements.

 Factors for modifying the tabulated data to suit special requirements regarding spring material, service life, or stress range.

3. Data for use in preliminary designs, where it is important to have advance information on the space requirements of the springs to be used.

 Data that can be used as a starting point in the design of springs to exacting specifications.

5. Tables of compression springs arranged by coil diameters from 1/8" to 4".

6. Tables of tension springs arranged

by coil diameters from 1/8" to 2".

7. Complete instructions and examples of how to use the tables to select the correct spring for every application.

English-German Technical and Engineering Dictionary

By Dr. Louis DeVries. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. Price \$20. 1014 pp.

This companion volume to the author's German-English dictionary gives quick, accurate translation of over 130,000 technical and engineering terms from English to German. It also contains thousands of general words and terms which translators have found essential for precise interpretations.

A total of more than 5000 new entries, not available at the time its companion volume was prepared, in such advanced fields as radar, television, electronics, rocket and jet propulsion, and nuclear engineering have been added.

Better Tool Cribs

By William Raisglid; published by The Industrial Press, 148 Lafayette St., New York 13, N.Y.; 152 pp.; price \$4.

This book demonstrates the way to

This book demonstrates the way to avoid confusion and wasteful methods of conducting tool-crib functions. By means of profusely illustrated descriptions, the author shows in detail how such items as milling cutters, honing units, counterbores, fly cutters, measuring tools, gages, machine parts, and other shop tools and materials should be stored.

Chapter headings are as follows: Location and Lay-Out of Tool Cribs; Methods of Storing Tools, Machine Parts, and Materials; Grouping and Storing Small Tools; Display Boards and Racks for Tool Storage; Brass Tool Check Systems; Improving Brass Tool Check Systems; Helpful Tips on Handling Tools and Materials; Records that Must be Kept; Tool Charge-Slip Control Systems; Marking Systems for Tool Cribs; Special Sections in the Tool Crib; Central Tool Crib and Sub-Cribs.



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Rod, Bar and Wire Product Information

Published by Kaiser Aluminum & Chemical Sailes, Inc., 919 N. Michigan Ave., Chicago, Ill. Free upon request on company letterhead. 106 pp.

This book contains information on the selection and use of the most suitable aluminum rod, bar and wire for different applications. The production of aluminum and its specific properties and characteristics as related to rod, bar and wire are also covered. Data about various alloys and their applications are presented, together with discussions of fabrication and finishing methods. Helpful engineering tables will simplify and speed reference work.

Cams-Design and Layout

By Louis Kasper, chief mechanical engineer, Steel Heddle Mig. Co.; published by Chemical Publishing Co., Inc., 212 Fifth Ave., New York; 84 illustrations; 102 pp.; price \$3.50.

This book gives sufficiently detailed explanation of cam designing, but no cumbersome calculations which are time consuming and unnecessary in applications. Examples of design and layout cover frequently occurring cases in industrial uses of cams.

Chapter heads include: Types of Cams; Cam Design and Layout; Reciprocating Cams; Rotating Cams; Cylindrical Cams; Wiper Cams, Rocker Cams and Rolling Levers; Rectangular-Motion Cams; Sleeve Cams; Miscellaneous Cam Applications.

Dynamics of Machinery

By A. R. Holowenko; published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16; 464 pp.; price \$7.50.

Here is an easy-to-read, informative guide to a complete understanding of problems of dynamics in any machine in which there are moving parts. The basis of the study is Newton's laws, the relative velocity equation, and the relative acceleration equation.

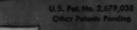
The book is outstanding for its clear and logical development of proofs and its abundance of illustrations. A signifi-

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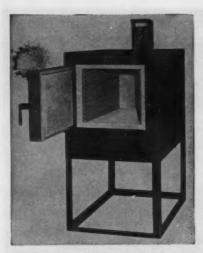
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cant departure is a breakdown of analyses into parts, showing a step-by-step construction, with final results presented only after the steps have been discussed and explained in a series of isolated figures.

In the development of relations the author has used both analytical and graphical proofs when one supplements the other. The relationship of equations to graphical solutions is clearly explained. Problems, carefully graded in difficulty, accompany each chapter. The material is in general directed toward background with which the design engineer should be familiar.

Waterhammer Analysis

By John Parmakian, head of Tech. Eng. Analysis Sec., Design Div., Bu. of Reclamation, Denver, Colo.; published by Prentice-Hall, Inc., 70-BB Fifth Ave., New York 11; 161 pp.; price \$6.50.

This is a systematic and complete treatment of the waterhammer question. The author covers a broad range of problems with 100 graphs from which solutions can be obtained with little effort. Graphs representing pump discharge line transient pressure effects, surges in surge tanks, and in air chambers on pump discharge lines are an invaluable aid for estimation purposes.

The beginning chapters treat the rigid and elastic water column theories. A comparison is made between the two theories, and the limitations of the rigid water column theory are shown.

A chapter is devoted to the velocity of waterhammer waves in various types of conduits, and extended treatment is given to the transient pressure problem on pump discharge lines.

Tool Design

By William R. Jeftries; published by Prentice-Hall, Inc., 70 Fifth Ave., New York 11; 218 pp.; price \$6.35.

This book brings the reader an authoritative introduction to the whole field of tool design. It gives actual instructions on how to design machine tool jigs and fixtures, weld and asfor rounding . chamfering . pointing . burring

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Flexibility
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Machines

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For burring or chamfering both ends at the

helical gears · spiral bevel pinions

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Typical production—chamfering 8 pitch 40



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For mass production or short run jobbing operations, there is a Cross Gear Machine to suit your requirements.

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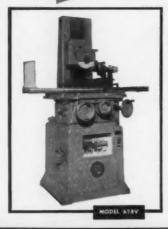
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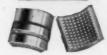
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Benco Master Collets more than pay for themselves through improved production, fewer rejects, reduced down-time. "Cam-grinding" on the taper assures maximum ease of operation in the chuck head. Accurate machining and careful inspection provide long life and continuous, trouble-free performance.

Pads are much cheaper than collets! See illus, tration for examples of saving in cost. On every job, large or small, you'll appreciate the advantages of Benco Master Collets and Pads. A large assortment of standard types and sizes are ready for immediate shipment. Get your supply now!

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collet manufacturing co.

cleveland 14, ohio

REPRESENTATIVES: Tornquist Machinery Company, Los Angeles, Calif.; Dorow Machine Tools, Wichita, Kan.; Harry Dunn Goro., Houston, Texas; J. K. Bousum Co., Detroit, Mich.; Walter J. Greenleaf Co., Pittsburgh and Erie, Pa.; Hospelhern Tool & Supply Co., Dayton, Ohio; Kel.; Tompany, Milwaukee, Wise.; Mason & Luttrell Sales Eng., Okemes, Mich.; Fred J. McMillen, Providence, R. L.; Pearse-Dengel Tool Company, Hasbrouck Heights, N.J.; Philadelphia Tool Company, Bala-Cynwyd, Pa.; Erwin A. Slate, Gasport, N.Y.; W. C. Straub, Cleveland, Ohlo; G. W. Wittlinger, Chicago, Ill.; J. E. Dilworth Cempany, Memphis, Tenn.; H. M. Scherling, Minneapolis, Minn.; Die Makers Supply Co., Kansas City, Mo.; H. F. Sederling Co., Seattle, Wash.; Production Tools, Toronto, Canada.

Encircle No. 2C on card opposite page 65

your best bet... BSA

single spindle automatic screw machines

for fast, economical single spindle bar work up to 2" diameter

BSA Tools Ltd. of England, one of the world's oldest and largest machine tool builders, have produced and distributed thousands of these BSA "Singles" since they introduced them in 1926.

Available in five standard capacities: 1/2", 3/4", 1", 1%", and 2"

All models use STANDARD AMERICAN TOOLING.

Wide range of spindle speeds -200 to 6000 on 1/2" machine, 69 to 1260 on 2" model.

Cams, change gears and tooling easily accessible for quick job-to-job changeover.

Unit construction provides quick access for easy maintenance.

Special spindle mounting, designed to reduce wear.

Cross slides and turret mounted on replaceable ways.

Positive chain drive from gear box to spindle prevents slippage.



distributed and serviced in U.S.A. by NATIONAL ACME

Since their introduction in this country, BSA Single Spindle Automatic Screw Machines have enjoyed remarkable acceptance, Combining latest automatic screw machine principles with proven

design, they have produced at top standards of speed and accuracy with minimum upkeep.

BSA "Singles" are distributed and serviced in the United States by National Acme, in Cleveland, where adequate replacement parts are stocked -and you get the same active, experienced and interested service support as that on which National Acme's reputation has been built.

For specifications on all sixes, write for Bulletin BSA-54

Encircle No. 2D on card opposite page 65



THE NATIONAL ACME COMPANY

177 East 131st St., Cleveland 8, Ohio

sembly fixtures, punch press tooling, and hydraulic press tooling. The author also explains pressworking machines and tools, and devotes one chapter to clamps and methods of clamping and locating.

Helpful reference appendices provide factual data on drafting practice, standard drill bushings, standard die sets, standard parts, decimal equivalents, wire and sheet metal gages, and hardness conversion tables.

To make the text easier to understand, the author has avoided needless technical expressions. Throughout he has included a wealth of illustrations so that the reader can see how a particular procedure is carried out at the same time as it is described. The book is conveniently arranged for either consecutive reading or ready reference.

Holes, Contours and Surfaces

By Richard F. Moore and Frederick C. Victory. Published by the Moore Special Tool Co., Inc., Bridgeport, Conn. General price, \$7.50; to the metalworking industry, \$5. 424 pp.

This important contribution to technical literature on toolmaking is claimed to be the first exhaustive book on the methods and equipment that provide engineered solutions to the problems of the accurate locating and machining of holes, contours and surfaces. It is illustrated with more than 450 photographs and working drawings, including 184 pages of Woodworth tables for converting holes, from 3 to 100, on circles to rectangular coordinates. The work covers the major developments that have taken place in the field since Moore's first book, "Precision Hole Location," published in 1946.

Following are the chapter titles of this second volume: The Problem of Location; Improved Location Equipment and Methods; The Foundation of Accuracy; Engineered Location Equipment Standards; The Coordinate Locating System; Jig Boring Principles and Application; Jig Boring Practices: Jig



Save time, save gas . . . heat treat carbon and high speed steels, dies and tools with JOHNSON 142. Powerful burners provide fast uniform heat with time saving speed. Gets the job done while other furnaces are still warming up. Temperatures easily regulated with accuracy. Counterbalanced door opens upwards. Firebox 7" x 13" x 16½" lined with high temperature refractory. Complete with Carbofrax Hearth. G.E. Motor and Johnson Blower.

For temperature range

1300° to 2450°F\$337.00

F.O.B. Factory

Models available in smaller firebox sizes. Write for Free Catalog.

JOHNSON GAS APPLIANCE CO. 570 E Ave. N.W., Cedar Rapids, Iowa

Since 1901 JOHNSON FURNACES FOR INDUSTRY

Encircle No. 325 on Card, Opposite Page 65

New Mall

PORTABLE ELECTRIC REVERSIBLE SCREWDRIVER



Flick of the Switch Throws it in Reverse

It's lightweight! It's highly maneuverable! It drives all standard screws...and just a flick of the switch

throws it in reverse. Adjustable slip clutch gives a predetermined set to each screw driven. This versatile model is built to handle fast production work in metal or woodworking shops. Productive capacity combined with moderate price make Model 143SR a real money-saver. Try it soon in your operation.

- Handy reversible switch conveniently located for quick flick of your thumb.
- Slip clutch automatically "slips" when proper screw tension is reached.
- Adjust clutch tension quickly from outside without dismentling.
- · Built-in trigger switch in pistol grip handle.
- Call or write the Mail Service Warehouse nearest you for a Free Demonstration of the Mail Reversible Screwdriver

	PORTABLE POWER TOOLS GASOLINE-ELECTRIC-AIR
	e., Chicage 19, Illinois cts about the new Mall river.
Name	
A T ORCITO	
Company	

Encircle No. 326 on Card, Opposite Page 65

Grinding Principles and Applications; Jig Grinding Holes; Jig Grinding Contours; Linear Form Grinding Principles and Applications; Linear Form Grinding Practices; Inspection Methods; Precision Pays Dividends.

Titanium in Iron and Steel

By George F. Comstock, consultant to Titanium Alloy Div., National Lead Co.; published for The Engineering Foundation by John Wiley & Sons, Inc., 440-B Fourth Ave., New York 16; 294 pp.; price \$6.00.

This book critically reviews and correlates important data on titanium as an alloying element in iron and steel. Nearly 300 papers were reviewed for the manuscript.

Opening with a general discussion of titanium and its minerals—principal sources, concentration, preparation—the book goes on to examine the properties and effects of the element as an addition to cast iron and steel. Special emphasis is placed on its unique effects in stabilizing nitrogen and in fixing carbon in alloys where other carbides may be undesirable, on its usefulness in steel which is to be enamelled, and in certain complex ferrous alloys for high-temperature application.

Technical FILMS

A new approach to copy turning

The New Britain Machine Co. New Britain-Gridley Machine Div. New Britain, Conn. Color, sound, 16mm, 28 min.

This film describes the New Britain GF copy turning machine—said to be a new approach to the problems of doing contour copying whether it be shafts, bores or face contours. This line was designed in Switzerland and has proven itself to be a cost-cutting piece of equipment in metalworking plants in Europe; redesigned by New Britain for the American market.

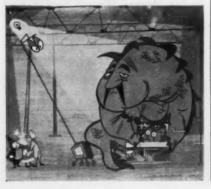
The film depicts this new single point copying method and shows an operator going through the various setup and change over steps. He also demonstrates the operating features of the machine. Animated drawings explain the compact copying slide and carriage and show typical work applications.

William Johnson and the Draggin

The Cincinnati Milling Machine Co. Advertising Dept., Section MTB Cincinnati 9, Ohio. 13 minutes, 16 mm

This new Technicolor sound movie stimulates renewed interest in effective machine replacement programs by presenting the subject in a humorous vein. It is suitable for all levels of audiences from foremen to top management.

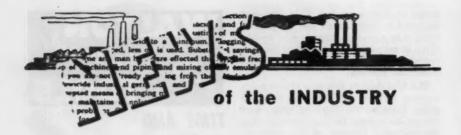
The story is unique and interesting. King Customer becomes dissatisfied because of the lack of progress, and decides that something is "draggin." His advisers suggest various unsound remedies, but Engineer William Johnson locates the real trouble with his "draggin locator." The film is devoid of any type of advertising.





December, 1955

Encircle No. 327 on Card, Opposite Page 65



MTBB \$2500 Production Contest Announced

Machine and Tool Blue Book announces as a special feature of its 50th anniversary year a \$2500 cash prize production contest. Open to metalworking industry people in the continental U.S., prizes will be awarded for discussions of actual production techniques, tooling ideas, or machining methods which have been employed in industry to increase production and/or cut costs. A description of the former method, the problems presented by the operation, and the solution of the problem should be included in each entry. Winners will be judged only on the basis of the job or operation described and the resulting production economies of the new method rather than on the basis of the article's literary merits or the elaborate presentation of material. Essential facts, together with any photos, drawings or sketches of the operation should be included.

First prize in the production contest is \$1000: second prize is \$500. A third prize of \$300 and a fourth prize of \$200 will be awarded, followed by five prizes of \$100 each.

Entries, which become the property of Hitchcock Publishing Company, must be postmarked no later than January 31, 1956, and should be accompanied by official entry blanks to be found on pages 134-135 of this issue.

No limit to the number of entries made by one person has been imposed. Even entries which do not win prizes can make money for their originators, who will be paid regular contributors' rates for material which is later published by Machine and Tool Blue Book.

Officers of NMTBA Named

Louis Polk, chairman and president of the Sheffield Corp., Dayton, Ohio, was elected president of the National Machine Tool Builders' Association at its 54th Annual Meeting held at New York recently.

Jerome A. Raterman, president, Mon-



Louis Polk



Jerome A. Raterman







Perrin G. March



Ralph E. Cross



Charles S. Davis

arch Machine Tool Co., Sidney, O., was elected first vice-president, and Alfred V. Bodine, president and treasurer of the Bodine Corp., Bridgeport, Conn., was elected second vice-president and director. Perrin G. March, III, president of the Cincinnati Shaper Co., Cincinnati, O., was re-elected treasurer. William E. Rutz, executive vice-president, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., currently a director, was elected secretary.

New directors elected, in addition to Mr. Bodine, were: Ralph E. Cross, executive vice-president and secretary of the Cross Co., Detroit, Mich., and Charles S. Davis, Jr., vice-president of Lake Erie Engineering Corp., Buffalo, N.Y.

Tell Berna, for the last 18 years general manager of the association, was elected executive vice-president.

Chairman Hicks Speaks

The "apparent lack of reciprocity" in reciprocal trade agreements with respect to machine tools was emphasized by Everett M. Hicks, vice-president and general manager, grinding machine division, the Norton Co., Worcester, Mass., who is chairman of the government relations committee of the National Machine Tool Builders' Association, in an address before the Association.

"Several years ago," Hicks said, "the U. S. machine tool tariff was cut in half from 30% to 15%. We have not

been able to perceive that any similar actions have been taken by foreign governments on the products we sell.

"Even more important than this are the quotas and other artificial restrictions which are imposed by many foreign governments. England, for example, bars the importation of any machine tool of a class or kind which is made in England.

"Some time ago the French government relaxed its rigid restrictions on the import of machine tools except on those coming from the United States. At the same time a compensatory tax was added which, on machine tools, amounts to about 10 or 15%. This tax, combined with the tariff and various other documentation and import levies and taxes of various kinds, adds in total about 55% to the cost of an American machine tool when imported into France.

"We hope that the representatives of the U. S. will attack these artificial restrictions, in order that we may obtain some true reciprocity between the United States and other countries."

Atomic Exposition

The Atomic Exposition, sponsored by the American Institute of Chemical Engineers in conjunction with the 1955 U. S. Nuclear Congress, will be the largest showing of nuclear and related materials and equipment for use in peace-time applications of atomic energy ever shown in the United States. An actual experimental reactor will be in operation at the Exposition.

Exposition Data

Dates: December 10-16, 1955, inclusive.
Place: Cleveland Public Auditorium,
Cleveland, Ohio.

Hours: December 10 and 11—2 P.M. to 10 P.M. (Open to industry and general public)

December 12 through 15—10 A.M. to 10 P.M. (Open to public at 6 P.M.) December 16—10 A.M. to 5 P.M.

Sponsor: American Institute of Chemical Engineers.

Management: International Atomic Exposition, 931 Book Building, Detroit 26, Michigan. A. F. Denham, Director; J. V. Friel, Manager.

Area: Approximately 80,000 square feet.

Type of Exhibits: Equipment and materials for atomic reactors, reactor models, reactor in operation, instrumentation, isotope applications for industry, agriculture and medicine, educational exhibits, etc.

Exposition Audiences: 1. Management, engineering and scientific personnel

in the nuclear power and allied fields.

Users and potential users of materials, equipment, services, etc., based on nuclear developments.

 Producers of components, materials, equipment and services for use in the nuclear field.

 Companies not primarily interested in nuclear developments but looking for ideas that may be useful to them.

5. Representatives of government and education.

General public (during non-business hours only).

Registration for Nuclear Congress: Through Engineers' Joint Council and at Cleveland Auditorium (includes exposition).

Registration for Exposition Only: At Auditorium.

Nuclear Congress Exposition Headquarters: Nuclear Congress Lounge in the Arcade of the Auditorium between North Hall and Lakeside Hall.

Exposition Headquarters: International Atomic Exposition, 931 Book Building, Detroit 26, Mich.





New building planned by Acme Industries, Inc., with first unit now under construction. Program represents an extensive addition to present facilities, which will continue in use.

Second Training School Held by Mattison Machine Works

The second grinder training school was held recently at the Rockford plant of Mattison Machine Works. In attendance were sales representatives from Neff, Kohlbusch & Bissell of Chicago and Milwaukee; Seifreat-Elstad Machine Co., Columbus and Dayton; and Riordan Machinery Co., Detroit, Mich.

The representatives receive three days of training in the engineering features

and sales advantages of the company's grinders. Moving pictures and illustrated technical lectures are used to explain the basic principles of operation. Every machine in the line is analyzed and the men spend time in the shop getting actual experience in operating different types of grinders. These schools will be held until every representative has had an opportunity to attend.



December, 1955



A 104,000 square foot parts plant in Russellville, Ky., for the Rockwell Mfg. Co. is slated for completion early next year. It will turn out parts for all Rockwell products. The new one-story building will have an exterior of masonry and insulated aluminum panels, and interior walls of glazed tile.

BALDOR GRINDERS

BALL BEARING - TOTALLY ENCLOSED - HEAVY DUTY



Baldor Grinders are available in bench and pedestal types.

Baldor 10" Series Grinder 34 h.p., 1 phase, 60 cy., 1725 rpm, 10" wheel. \$148.00.

More Rugged — Arbor diameter %" and "sealed-for-life" ball bearing Size .05.

More Versatile—Wide clearance between wheels and motor frame permits grinding of large or odd shaped pieces.

Baldor is a basic manufacturer of grinders—even the motors are built by Baldor.

Baldor Grinders available with wheel sizes from 6" to 12".

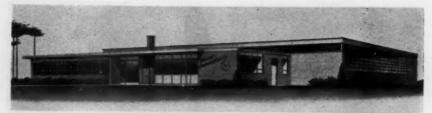


Special Carbide Tool Grinder built especially for sharpening carbide tools quickly and accurately. Reversible ½ h.p., motor withstonds repeated overloads. \$164.20.

BALDOR ELECTRIC COMPANY
4368 DUNCAN AVE. ST. LOUIS 10, MO.

Encircle No. 328 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK



Detroit Reamer & Tool Co. has moved into its new plant and offices located at 780 West Maple Rd., Birmingham, Mich. Total floor space approximates 14,000 square feet and will nearly double Detroit Reamers present production area.

Need a <u>really</u> accurate collet chuck?

Before you buy **COMPARE** the new HANCOCK Ball-Bearing CHUKOLLET with any collet holder.

COMPARE for accuracy!

COMPARE for versatility!

COMPARE for gripping power!

COMPARE set-up time!

COMPARE price!

No collet chuck is as versatile, can grip as tightly or as accurately as the new Chukollet. Can be used on any machine in the shop.

No other collet chuck has an adjustable stop for positive axial location to .0005 inch! 5C collet is not drawn in while closing.

See for yourself. Make a test in your own shop next time you have a job that demands the ultimate in axial and radial accuracy. Remember, Chukollet is guaranteed. Money refunded in 30 days if not completely satisfied! Send for literature today.

Manufacturers' agents and dealers, several territories available.

HANCOCK MFG. CO.
Santa Clara, Calif.



Now under construction in the Chicago suburb of Morton Grove, two one-story buildings to house extensive research and laboratory operations for Crane Packing Co., Chicago. New buildings cover 46,500 sq. ft. in area. In addition, a 126,000 sq. ft. one-story factory building is already in operation.

Open House at Dreis & Krump Plant

Dreis & Krump Manufacturing Co., Chicago, entertained the employees and their families at a Family Day and Open House recently. Over 2500 people were given a conducted tour of the plant. A buffet luncheon was served.
A large sheet copper statue of Tubalcain, the Biblical prototype of blacksmiths and sheet metal workers has been erected outside of the plant's main

LETTZ OPTI-COMPARITOL

An amplifying gage of semi-optical design for gaging outside dimensions, lengths and thicknesses precisely and rapidly.

Its unusual design makes it sensitive enough for the finest tool and gage inspection, with the necessary ruggedness for fast, day in - day out - production inspection.

Brightly illuminated screen makes the readings unmistakable, at a glance. Adjustable red tolerance shield shows undersize pieces and green tolerance shield shows oversize pieces.

If it's White - It's Right

Reads in .00005" - Range ± .005" Capacity 6"

WRITE FOR COMPLETE LITERATURE
In certain territories inspection may be arranged

Geo. SCHERR OPTICAL TOOLS, Inc.

200-MT LAFAYETTE STREET . NEW YORK 12, N. Y.





building. The statue was originally part of the exhibit of Strumm Bros. and Rudolph Bocking Co. of Germany at the World's Columbian Exposition in Chicago in 1893.

The ONLY Live Center On Which Points May Be Interchanged to ±.0001



Empire Live Centers

Quality engineered for use on lathes, grinders, and milling machines . . . Empire Live Centers are versatile, accurate, heavy duty. Tapered seats give consistent precision alignment . . . assure accuracy of .0001. Positive seal eliminates dirt, grit, cutting oils. Combination bearings absorb both radial and thrust loads.

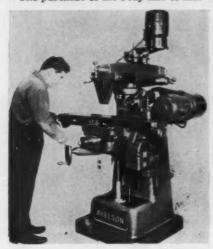


Manufactured in all tapers: Morse, Brown & Sharpe, Jarno, and straight shank. Special shanks and points to order.

Empire Toolmaker's Set available in handrubbed American Walnut case.

ROYAL PRODUCTS, 84 Union Street, Mineola, L. I., N. Y. Ploneer 6-4245

Axelson enters milling machine field The purchase of the Fray line of mill-



ing machines and milling attachments from the Fray Machine Tool Co., Burbank, California, has been announced by the Axelson Manufacturing Co., Division of U.S. Industries, Inc., Los Angeles. The milling machines will be manufactured in the same plant that has built the Axelson heavy duty lathes and special machine tools since 1915.

Two branch offices formed

Huron Machine Products Inc., Dearborn, Mich., has expanded facilities to include a stocking office on both coasts. One is located at West Hartford, Conn., the other, at Burbank, Calif.

Both of these offices carry a complete line of the company's gage supplies that can be shipped from stock.

Pneumatic THROATLESS SHEAR

to any Shape!

- Compactly built for maximum visibility and efficiency
- Operates on 35 to 150 PSI air pressure
- Adjustable power and return stroke length and speed

Beverly Pneumatic Shears combine all the advantages of Beverly Throatless Shears with fast, effortless cutting action through air cylinder operation. Air operation speeds work, permits accurate cutting to a pattern or template, as operator can concentrate on guiding work through the shear. Flow control valves permit precise adjustment of stroke speed; adjustable actuating arm controls stroke length. Foot Switch permits operator to use both hands on the work niece. Operates on 110V. 60 cycles AC and 35 to 150 PSI air pressure.

See your nearby Beverly Distributor

Write for catalog sheet and complete details.

BEVERLY SHEAR MANUFACTURING CO.

CAPACITY

3/16 MILD STEEL 10 GA.

STAINLESS

Encircle No. 332 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

\$750,000 expansion program nears completion



A \$750,000 expansion and modernization program is nearing completion at The Producto Machine Co.,

Among the improvements are a modern cupola installation. It includes a mechanical charger which can be loaded from the outside materials yard with the proper amounts of pig iron, limestone, and coke to permit a more accurate control of the metals cast in the foundry. In addition, a new dust collector installation has been placed on the stack of the cupola, which uses a washing system to prevent the spread of smoke, soot, and fly ash.

This mechanical charger is one of the additions made in the foundry of The Producto Machine Co. It is loaded from the outside materials yard with the proper amounts of pig iron, limestone and coke to permit an accurate control of the metals cast in the foundry.



193

Howe & Fant Move to New Plant

Howe & Fant, Inc., manufacturers of the H&F turret drilling machine and turret drilling attachment, have moved into a modern, one-story plant at 20 Fitch St., East Norwalk, Conn.

This move makes possible an increase

in production and provides adequate space for further expansion when required. The new plant has been equipped with machine tools and other equipment of the latest type.

R. B. Fant (left) and A. S. Howe, Jr., inspect the assembly line at their new plant.



Burg Tool announces new eastern sales office

Burg Tool Mfg., Co., Inc., Gardena, Calif., has set up the Burgmaster Eastern sales division. Bill McAvay, general manager, heads the new office, located at 15 W. 44th St., New York City.



Bill McAvay

Reed-Prentice opens new sales offices

Branch sales offices in Buffalo and Los Angeles have been opened by Reed Prentice Corp., Worcester, Mass., for direct sales of Reed-Prentice plastic injection molding and die casting machines.

Robert W. Carr is managing the West Coast office. Working out of the Buffalo office, C. W. Kendall covers the western New York and Pennsylvania territories.

Appointments and Promotions

Name	Company	To	Position
Dr. Luther M. Foster	Aluminum Research Lab. New Kensington, Pa.	Same	Chief of the Physical Chemistry
Ernest C. Hartmann	Aluminum Research Lab. New Kensington, Pa.	Same	Division Asst. Director of Research
Harry N. Hill	Aluminum Research Lab. New Kensington, Pa.	Same	Chief of the Eng. Design Div.
Dr. Allen S. Russell	Aluminum Research Lab. New Kensington, Pa.	Same	Chief of the Process Metallurgy
Dr. Phillip T. Stroup	Aluminum Research Lab. New Kensington, Pa.	Same	Asst. Director of Research
Vincent E. Lysaght	American Chain & Cable Co.	Same	General Sales Manager
R. B. Blythe	Are Aircraft Products Div. Bryan, Ohio	Same	Asst. to the Vice-President
James F. Healey	U.S. Air Force Baltimore, Md.	Are Aircraft Products Div. Bryan, Ohie	Technician
D. W. Orrick	Are Aircraft Products Div. Bryan, Ohio	Same	Sales Manager of Aircraft Pred.
James P. Flatter	Baker Brothers, Inc. Toledo, Ohio	Same	Secretary and Treasurer
Lewis Pascoe	Baker Brothers, Inc. Toledo, Ohio	Same	Asst, to the President
Julius J. Kirchhof	Franklin Balmar Corp. Baltimore, Md.	Same	President
John N. Merkle	Franklin Balmar Corp. Baltimore, Md.	Same	Vice-Chairman of the Board of Directors
Lee Reuland	Barber-Colman Co. Rockford, III.	Same	Division Manager
Harry T. Burke	E. W. Bliss Co. Hastings Division Hastings, Michigan	Same	Chief Engineer
Wallace E. Anderson	Brown & Sharpe Mfg. Co. Providence, R.I.	Same	General Sales Manager
George A. Hawkins	Brown & Sharpe Mfg. Co. Providence, R.1.	Same	Director of Market Research and Sales Promotion
Earl P. Leeds	Brown & Sharpe Mfg. Co. Providence, R.I.	Same	Asst. General Sales Manager
Harold B. Schott	Brown & Sharpe Mfg. Co. Providence, R.I.	Same	Director of Industrial Products Sales
Alfred W. Sparrow	Brown & Sharpe Mfg. Co. Providence, R.I.	Same	Director of Screw Machine Sales
Willard H. Spence	Brown & Sharpe Mfg. Co. Providence, R.I.	Same	Asst. to the Vice-President and Treasurer
E. J. Weller	Carboloy Dept. of General Electric Detroit, Mich.	Same	Manager of Tool Sales
Arthur T. Daiten	Chicago Wheel and Mfg. Co. Chicago, III.	Same	Vice-President in Charge of Sales
Honry M. Mann	Chicago Wheel and Mfg. Co. Chicago, III.	Same	Secretary-Treasurer
David A. Wallace	Cincinnati Lathe and Tool Co. Cincinnati, Ohio	Same	Sales Manager
William G. Catheart	C.I.T. Corporation Chicago, III.	Same	Regional Vice-President
Donald E. Kidd	C.I.T. Corporation New Jersey	Chicago branch	Asst. Vice-President and Division Head
Harry Cotesworth	Cleveland Crane & Eng. Co. Wickliffe, Ohio	Same	Chief Engineer of the Development Department
Kurt R. Welss	Cleveland Crane & Eng. Co. Wickliffe, Ohio	Same	Chief Engineer of the Cleveland Tramrall Division
William H. Knoell	Crucible Steel Co. of America Pittsburgh, Pa.	Same	Assistant Secretary
E. Hugh Jones	Ex-Cell-O Corporation Detroit, Mich.	Lima, Ohio branch	Operations Manager
Richard A. Lodge	Ex-Cell-O Corporation Detroit, Mich.	Lima, Ohio branch	Asst. Sales Manager In Charge of Sales
Jack H. Powers	Firth-Loach Metals, Inc. Mc Keesport, Pa.	Same	Superintendent, X-ray and Metallography



Literature

CATALOGS AND BULLETINS AVAILABLE FROM MANUFACTURERS

For copies of the literature in which you have an interest use the postage-paid postcard between pages 234-235. Merely circle the identifying number and mail the postcard.

1. Cold Roll Forming. The fourth (revised) edition of the Yoder book on Cold-Roll Forming, is available from The Yoder Co., Dept. BB, 5500 Walworth Ave., Cleveland 2, Ohio. The bcok includes an illustrated story of the equipment and process of cold roll forming; end uses of its products; their advantages and commercial possibilities. Also auxiliary equipment for curving, coiling, ring-forming, notching, perforating, welding, embossing, automatic cut-off and other operations frequently incorporated in cold-forming production lines.

2. Milling Machine. Cincinnati dial type milling machines are described and illustrated in a new bulletin published by The Cincinnati Milling Machine Co., Dept. MTB, Cincinnati 9, Ohio. These machines are said to incorporate many time and effort saving conveniences with smooth reliable performance. Plain and vertical styles are available with or without automatic table feed cycles. Specifications are included along with highlights of design.

3. Multiple Spindle Machines. A new book published by The National Acme







FIRST CLASS
PERMIT NO. 272
SEC. 34.9, P. L. & R.
WHEATON, ILLINOIS

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MARK HARD METALS...

highly stressed parts

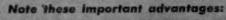
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- no burrs . . . works fast and clean
- marks parts in finished state
- simple operation—no experience necessary

new hermes ENGRAVING MACHINE CORP.

Encircle No. 334 on Card, Opposite Page 65

December, 1955

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Co., Dept. B, 177 E. 131st St., Cleveland 8, Ohio, is confined to Tooling Practices actually used on 44 different bar machine set-ups in plants of Acme-Gridley multiple spindle customers. The pages deal with performance facts, not with generalities. Book includes sections covering: normal tooling practice; second operation savings; magazine work loaders; special bar machine uses; range of models and sizes; and service and parts manual.

4. Chucks. Several new bulletins are available from the Horton Chuck Co., Dept. BMT, Windsor Locks, Conn., describing their complete line of chucks. Horton's Tru-Set chuck guarantees accuracy to .0002" T.I.R. This is made possible due to the Micro-Screw adjustment feature of the chuck back which enables the lathe operator to align the work piece practically within the limits of the accuracy of the lathe.

5. Presses. Bulletin 65-C, released by Niagara Machine & Tool Works, Dept. B, 637 Northland Ave., Buffalo 11, N.Y., describes and illustrates the upright series B, and inclinable series B1, gap frame double crank presses. The double crank design resists tilting of the slide under off-center loading, thereby reducing misalignment of dies. Die area

is accessible from all sides. Work may be fed from either side or front-to-back with equal facility.

6. Holding Tools. Catalog R-12, published by Lapeer Mfg. Co., Dept. MTB, 3056 Davison Rd., Lapeer, Mich., describes and illustrates their line of Knu-Vise toggle action clamps, pliers and wrenches. All models of the toggleaction clamping devices are developed and scientifically tested for strength and wear to meet strenuous production requirements under the recommended load.

7. Cut-Off Machine. A new catalog covering automatic and manual cutting-off machines and bar feeders, hot spinning machines that seal the ends of tubes is available on request from Modern Machine Tool Co., Dept. BMT, 2007 Losey St., Jackson, Mich. These machines are fully automatic lathe type that use standard bevel cut-off blades.

8. RPM Checkers. All machines are designed to produce most efficiently at a particular speed. Montgomery Tools, Dept. BB, 7 Tichenor Lane, Newark 5, N. J., has available a bulletin describing their RPM checker that will do the job with a minimum of effort, quickly and accurately. They are used for











One of many automatic brushing setups used by automotive manufacturers to finish transmission parts and other components.

BURRS left on automatic transmission parts can break loose in service, clog hydraulic lines and cause serious damage.

The two sections of a transmission cover shown above prove how thoroughly power brushing removes burrs and blends surface junctures . . . leaves the part smooth and clean.

Have an Osborn Brushing Analysis made of your operations. It costs you nothing, but may save thousands of dollars in your finishing of parts. Write The Osborn Manufacturing Company, Department L-16, 5401 Hamilton Avenue, Cleveland 14, Obio.





BRUSHING METHODS . POWER, PAINT AND MAINTENANCE BRUSHES BRUSHING MACHINES . FOUNDRY MOLDING MACHINES

checking generators, motors, machine tools, portable power tools, spindles, looms, gears, vanes, pulleys, shafts and turbines.

- 9. Socket Screw Products. A handy data file has been published by the Mac-it Screw Div. of Strong, Carlisle & Hammond Co., Dept. B, 1392 W. 3rd St., Cleveland 13, Ohio. The file contains information in compact, easy to read form, designed for hanging on the wall. Seven types of Mac-it socket screws plus Mac-it-hex-socket keys are discussed with regard to: dimension standards; standard sizes; physical properties; recommended tightening torque; and suggested applications and uses.
- 10. Communication System. The M-S-A Audio Safety System, an inter-plant or mine communications system, is described in a new bulletin recently published by Mine Safety Appliances Co., Dept. TMB, 201 N. Braddock Ave., Pittsburgh 8, Pa. Tailored to meet the needs of any installation, this audio system can be used to transmit repeated safety reports, instructions, announcements, and all other information which must be disseminated with speed and accuracy.
- 11. Gear Classifier. Operation and design of Michigan 3-Way Gear Classifiers are described and pictured in a new bulletin, No. 355, published by Michigan Tool Co., Dept. MB, 7171 E. McNichols Rd., Detroit 12, Mich. Stepby-step action of the machines which automatically monitor oversize, undersize and correct size gears is explained. Also described is the 3-Way Classifier Controller and variations which are adapted for continuous belt conveying.
- 12. Boring Tools. Catalog CW-101, published by the Boring Tool Div. of Lehmann Machine Co., Dept. BB, 6724 Olive St. Road. St. Louis 5, Mo., describes and

illustrates their Car Wheel boring tools. These tools are manufactured of high grade alloy steel. Tools are manufactured in five styles, and machined to fit the ram of the machine in which the tool will be used.

- 13. Motors. A new bulletin issued by the Marathon Electric Mfg. Corp., Dept. MB, Wausau, Wis., describes and illustrates their new versatile integral hp motors. These 4 in 1 motors designed for modern industry combine cast iron brackets, cast iron frame, reinforced and milled feet for perfect alignment, internally ground stator, annealed laminations and many other improvements.
- 14. A four-page folder describing the contents of its new, 424-page book, "Holes, Contours and Surfaces: Located, Machined, Ground and Inspected by Precision Methods," has just been issued by Moore Special Tool Co., Inc., Dept. B, 740 Union Ave., Bridgeport 7, Conn. The folder contains a listing of the subjects covered in the book's 14 chapters and special Woodworth Circular Tables section.
- 15. Way and Surface Grinder. Mattison Machine Works, Dept. TBM, 545 Blackhawk Park Ave., Rockford, Ill., has published a booklet telling the story of the new combination way and surface grinder developed for the machine tool building industry. This massive new machine makes possible the grinding of large bed castings, columns, tables, saddles, and heads faster, to precision tolerances, without expensive rehandling.
- 16. More and better cleanliness programs in plants are the only answer to control of occupational skin diseases, according to Dr. Louis Schwartz, author of the booklet published by the Association of American Soap & Glycerine Producers, Inc., "The Prevention of Occupational Skin Diseases." Diseases of





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Your economy begins - and work quality improves-when you specify Staples carbide-tipped circular tools. They have established an enviable reputation throughout industry for delivering top-profit performance on every job.

A complete range of standard tool designs and sizes is available for quick delivery from stock. For your special tools, submit your specifications and prints for a prompt quotation. You'll be making the most of your standard and special tool investment when you put Staples Tools to work in your production.



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SHELL END MILLS

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Write for the Staples Standard Tool Catalog

CARBIDE-TIPPED CUTTING TOOLS

A complete line of Circular Carbide-Tipped Tools, Expansion Reamers — Special Tools

STAPLES TOOL COMPANY, CINCINNATI 25, OHIO

December, 1955

Encircle No. 336 on Card, Opposite Page 65

the skin are said to be taking a far larger toll than all other occupational diseases combined. Copies may be obtained by writing to the AASGP, Dept. MTB, 295 Madison Ave., New York 17, N.Y.

17. Tool Holders. Newcomer Products, Inc., Dept. BTM, Latrobe, Pa., has released a new bulletin describing and illustrating their Nu-Tool mechanical tool holders, used with Throway type

carbide inserts. The tools feature rugged design for faster production, no grinding and lower tool inventories. Included are styles available, prices and specifications.

18. Catalog No. 22, published by Northwestern Tool & Engr., Dept. TMB, 117 Hollier Ave., Dayton 3, Ohio describes and illustrates the following: step clamps, T-nut and stud sets; plain

METAL STAMPING SERVICE AT LOWEST POSSIBLE DIE COST

BAR STOCK TO STAMPING



The cost was cut from \$1.01 to \$0.11 each on this flange by redesign to a stamping instead of machining from bar stock.

The performance of the die-stamped part was equivalent.

On 1100 pieces per year, the saving was \$990.00, or -89%

This briefly describes the cost of a typical part made for one of our thousands of customers.

We have a short run stamping service to offer, which is beyond comparison.

Factory trained representatives in all centers. Write for full details.

DAYTON ROGERS

Manufacturing Company

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MACHINE and TOOL BLUE BOOK

sets; flanged, T, and coupling nuts; flat washers, toggle shoe clamps; cut thread studs; quarter turn, shoulder and knurled head screws; jig feet and rest buttons; cast iron hand knobs, and many other items in the Northwestern line.

19. Gear Machines. A new 16-page, twocolor catalog No. AP55-8 describing representative models in the company's line of Red Ring gear shaving machines, gear inspection equipment, gear lapping machines, gear grinding machines, self-contained broaching fixtures and broaches is now available from National Broach & Machine Co., Dept. BB, 5600 St. Jean Ave., Detroit 13, Mich. This folder is a reminder of the Red Ring line but descriptive literature is available on request.

20. Grinding and Lapping Machines. Norton Co., Dept. BTM, Worcester 6,

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Dust Collection

Easy installation . . . efficient low-cost operation . . . simplified maintenance, make Dust-kop FIRST among equipment to collect most all industrial dusts. There are Dustkop models to eliminate your dust problems . . . that are space saving, self-contained units, or exhaust type for rafter, ceiling or outside location. Write for descriptive literature.





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• READY TO USE

Also a Complete Line of Mist Collectors

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MANUFACTURING COMPANY

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Try the MODERN SAFETY DRILL TABLE



FREE TRIAL OFFER

For Faster, SAFER Work in Your Maintenance Department

Combines a drill table, a vise, a set of parallels and V blocks. No more lost fingers, from hand held jobs that slip. No more 30 minute set-ups for a 1 minute drilling operation. Made in 6 sizes, from 8" to 28" dia. We guarantee each Safety Drill Table will save its cost on labor alone in 6 months, to say nothing ot plant down time when vital maintenance is delayed even a few minutes.

WRITE FOR FREE FOIDER

Shows many typical set-ups, and use on radial drills. Complete specifications on all models. Covers MONEY BACK GUARANTEE and 30 DAY FREE TRIAL OFFER.



MODERN MACHINE TOOL CO.

Jackson, Michigan

For Precision Between Centers

EX-CELL-0

CENTER LAPPING MACHINES

Meeting today's precision standards requires careful checking of every phase of the job, including the center holes in the work. Ex-Cell-O Center Lapping Machines correct inaccuracies of center holes that affect the quality of all subsequent operations performed between centers. These machines are precision built and are easy to operate. They are fully described in Bulletin 40271—a copy is yours for the asking.

BEFORE LAPPING

AFTER

EX-CELL-0

EX-CELL-O ORPORATION

ROIT 32, MICHIGAN

Mass., has just published a new 32-page general catalog, No. 1843, of its precision grinding and lapping machines. It contains photographs and specifications of the Norton line of machines which include cylindrical grinders, cam, shape and crankpin grinders, tool and cutter grinders, universal grinders, surface grinders, lapping machines and special purpose grinders.

21. Rod Parters. A new 14-page manual

that illustrates how a Di-Acro Rod Parter cuts round, square, rectangular and hexagon bar stock without rough edges or burrs has been announced by O'Neil-Irwin Mfg. Co., 562 Eighth Ave., Lake City, Minn., makers of Di-Acro precision metalworking machines. The manual points out the many different types of stock that can be parted. Specifications and capacities on both hand and power operated rod parters are listed in table form.

HERE'S A TYPICAL HOLDING JOB





HOW MANY MORE DO YOU HAVE?

Here the new Jacobs Model 96 Rubber-Flex Collet Chuck holds a machined part for inspection.

We don't yet know all the applications for this marvelous holding device. We do know it is the most accurate collet chuck in the world ... that it holds any piece from $\frac{1}{16}$ " to $\frac{1}{16}$ " in diameter using only 11 collets, and has a gripping power unmatched by any split steel collets.

What are your work holding jobs for Model 96? Get the

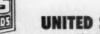
details on this great chuck from your industrial distributor, or write The Jacobs Manufacturing Co., 2212 Jacobs Road, West Hartford 10, Conn. Ask for Bulletin 54-CC.



22. Stainless Steel. Alloy Metal Wire Div., H. K. Porter Co., Inc., Dept. B, 342 Madison Ave., New York 17, N.Y., has announced the availability of its new 40-page Design Handbook. The handbook covers in detail the properties, specifications, applications and design data on the divisions 20 grades of stainless steel wire, rod and strip. Properties charts, size and weight charts, and other tabular data are also included.

23. Tapping Machine. A universal hand tapping machine, for accurate tapping of holes without tap breakage, is pictured and described in a 4-page bulletin available from The Producto Machine Co., Dept. BB, 990 Housatonic Ave., Bridgeport 1, Conn. This machine is said to permit tapping of holes at any point in the work within the area of the machine table. The table itself is drilled and tapped on the center line to permit bolting or clamping of work.





UNITED STATES DRILL HEAD CO.

616-618 Burns Street, Cincinnati 4, Ohio

24. The new Octopus Grip vacuum chuck; along with the complete line of Hetzel pumps; two tooling materials, Pioneer 921-T and Z-66; cast aluminum heating platens; lay-up molds; and a complete tool engineering service is described and illustrated in a catalogavailable from Pioneer Tool Engineering, Inc., Dept. MBT., 1601 E. El Segundo Blvd., El Segundo, Cal.

25. Lead Screw Tapper. Procunier Safety Chuck Co., Dept. B, 18 S. Clinton St., Chicago 6, Ill., has published an illustrated brochure revealing the new lead screw tapper. Each part produced by this lead screw unit is claimed to be gage perfect. The unit is said to eliminate part spoilage, stripped threads and thread distortion. The exclusive fingertip control eliminates operator fatigue and steps up production.

JOHNSON MODEL B LOW COST METAL BAND SAW PAYS FOR ITSELF MANY TIMES OVER

Whether in large shops or small... for production or occasional cutting on jobs where a smaller capacity range is sufficient, this handy, efficient Model B offers the traditional Johnson SPEED, VERSATILITY and ACCURACY at an investment that is surprisingly small. Available in Dry or Wet Cutting Models.



JOHNSON MANUFACTURING CORP.

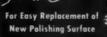
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MACHINE and TOOL BLUE BOOK

Here's How Simple Polishing Can Be...

Polishing Stand











Yes! Here's an effective method for handling polishing paper that has a definite place in many inspection departments and mechanical laboratories. The JOHN CRANE Portable Polishing Stand provides in a matter of seconds a wrinkle free 12" x 12" section of paper held absolutely taut over a metal stage that has been lapped to provide a perfect polishing surface. It also permits the instant replacement of this section of paper once it becomes worn.



For further details and other facts on this very practical tool, write for Bulletin L-410.

Crane Packing Company 6412 Oakton St., Morton Grove, Ill. (Chicago Suburb)

In Canada: Crane Packing Co., Ltd., Hamilton, Ont.



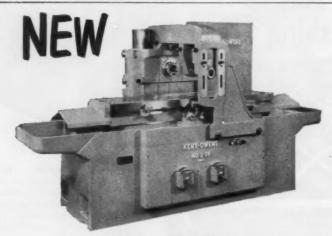
CRANE PACKING COMPANY

26. Jig Boring Machines. A new 7-page illustrated data sheet describing in detail type SJ and SJB jig boring machines is available from Homestrand, Inc., Dept. MTB, 9 Addison St., Larchmont, N.Y. Information includes a general description, specifications, detailed drawing and information on available accessories.

27. Filters. Bulk Filtration catalog 1054A describes and illustrates the Micronic

Filter line of Purolator Products, Inc., Dept. BB, Rahway, N.J. Included in the catalog is a general filter description; element specifications; filter construction; flow data; replacement parts list; filter dimensional specifications; servicing instructions; special filters; installation data; viscosity chart; particle size data; and engineering specification data.

28. Cams. A folder describing the evolution of three dimensional cams from



No. 3-36 HYDRAULIC MILLING MACHINE

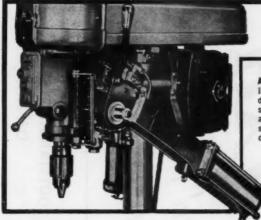
Now the new No. 3-36 in the Kent-Owens line of Milling Machines offers you the same unexcelled milling accuracy, speed and dependability for *larger size work*.

This ruggedly constructed miller has 36" table travel...64" x 16" table...full automatic hydraulic feed. Write for full specifications. Kent-Owens Machine Co., Toledo, Ohio.

Call on KENT-OWENS

for MILLING MACHINES

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MACHINE and TOOL BLUE BOOK

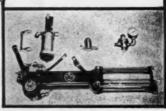


AT LEFT: 1/6" drill operates on 5 lbs. to 7 lbs. air pressure; 1/2" drill on 20 lbs. to 25 lbs. air pressure. Feed pressure at drill point averages 14x greater than air pressure, I. e. air pressure at 20 psi delivers 280 psi at drill point.

BELOW: Major components of new W-T Air Feed. No "electrics". No "hydrautics". Installs in about 10 minutes, no machining necessary. Just connect to nearest air supply.



AIR FEED DRILL PRESS



PAT. PENDING

Ingenious Air Feed gives you AUTOMATIC CYCLING FOR PRODUCTION DRILLING — AT LOWEST POSSIBLE COST!

What does it cost? W-T Air Feed Drill Press is available at a surprisingly modest cost. For example: a W-T 15"-4" Travel Drill Press complete with motor and Air Feed is priced from \$344.00. You can get the Air Feed unit only at \$185.50 to fit your W-T Drill Press (or any W-T type drill press up to 6" spindle travel). Compare these prices!

Profitable? W-T Air Feed is 100% pneumatic...requires virtually no maintenance...gives you fully dependable low-cost, automatic performance for a wide range of production operations. Does not interfere with any function, swing or position of the machine.

Accurate? Air Feed control — including checking and slowing-down at several points and at the break-through point— is accomplished by ingenious micro-valve

action. By positioning a valve stop, spindle will feed and retard continuously and automatically. Accuracy holds within 0.003".

Available? Your Walker-Turner Distributor has W-T Drill Presses equipped with W-T Air Feed. You'll find him listed in your local telephone directory. Call him, today.

WALKER-TURNER

· DIVISION ·

KEARNEY AND TRECKER CORPORATION PLAINFIELD, N. J.

DRILL PRESSES—Hand and Power Feed • AIR FEED DRILL PRESS ATTACHMENT • RADIAL DRILLS • Wood and Metal Cutting BAND SAWS • TILTING ARBOR SAWS • RADIAL SAWS • IG SAWS • LATHES • SPINDLE SHAPERS • JOINTERS • BELT AND DISC SURFACERS • FLEXIBLE SHAFT MACHINES

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premium Carbide at no premium price A heavy-duty, general purpose



OUTSTANDING FEATURES OF TXH

Higher hardness to strength ratio.



- Cooler operating temperatures.
- Higher edge strength.
- Greater resistance to abrasion.

designation for an altered existing grade. It is a completely new concept . . . a combination of materials and processes designed specifically to do heavy duty, high production cutting operations better than they have ever been done before. It does.

During development in Firth Sterling laboratories, FIRTHITE TXH out-performed and out-

lasted all other premium grades of carbide. After thorough introduction in the field, performance has exceeded laboratory predictions in case after

Here is a premium quality carbide developed for an age of automation which, at no extra cost, out-performs and outlasts all others.

Available from stock now in all standard tips and tools. Try it now and prove it yourself!

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PRODUCTS OF FIRTH STERLING METALLURGY
High Speed Steels
Tool & Die Steels
Stainless Specialties
High Temperature Alloys
High Temperature Cermets

CALL YOUR FIRTH STERLING DISTRICT OFFICE OR DISTRIBUTOR, ASK MR. TOOLEY. Encircle No. 347 on Card, Opposite Page 65

Where .0002

FELLOWS



Battery of Fellows 3" Gear Shapers (above) and 7-Type Gear Shapers (below) are daily turning out gears to .0002" tolerances in the Norden-Ketay shop.





THE PRECISION LINE olerances are routine...

s standard equipment!



Bomb director systems! Computers! Fire Control systems! Aircraft engine and flight control instruments! These are some of the products designed and manufactured by the Instrument and Systems Division, Norden-Ketay Corporation!

At the heart of these electro-mechanical devices are gears and gear trains which must have runout tolerances within .0002". To produce these high-precision gears Norden-Ketay relies upon Fellows Gear Production Equipment.

Fellows fully integrated line of machine tools assures absolute control over quality, as well as costs, wherever fine-pitch gears must be made to rigid specifications. In addition, they incorporate many modern features that not only permit much faster feeds and speeds, but also hold set-up time and change-over periods to a minimum.

If you are manufacturing fine-pitch gears, it will pay you to follow the example of other leaders in the industry, and consult with your Fellows representative. He will gladly provide all the technical data you desire, and where requested, give complete information about the Fellows Plan for deferred payment.

THE FELLOWS GEAR SHAPER COMPANY

78 River Street, Springfield, Vermont

Branch Offices: 319 Fisher Building, Detroit 2 • 5835 West North Avenue, Chicago 39 2206 Empire State Building, New York 1 • 6214 West Manchester Avenue, Los Angeles 45

Fellows Gear Production Equipment

theory to working finished product is available from The Parker Stamp Works, Inc., Dept. TMB, 650 Franklin Ave., Hartford, Conn. Featured in this bulletin are illustrations indicating the infinite number of stations possible on three dimensional cams by Parker.

29. Steel Stock. Bulletin 11-2, identified as a buyers' guide to bars, structurals, plates, sheets and strip, gives information on standard specifications

to which these steels are made; type, range, and accuracy of cutting to users' needs; and opportunities to save money by combining orders for these products. The bulletin available from Joseph T. Ryerson & Son, Inc., Dept. MB, Box 8000-A, Chicago 80, Ill., features hot rolled carbon bar, structural, and flat rolled steels.

30. Bearings. Pitchligh roller bearings are described and illustrated in a new



Send NOW for additional information on how YOU can increase YOUR production without additional equipment!

Drill — ream — countersink and counterbore, all on one drill press without setting up for each operation. A simple rotation of this turret head brings any one of four drills or cutting tools into position. Accurate — fast — economicall Try Quadrill — it will earn you more profit thru less production cost.



CHICAGO QUADRILL

-Company

BUSSE HIGHWAY, DESPLAINES, ILLINOIS

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MACHINE and TOOL BLUE BOOK



VASTLY LONGER-LIVED AND MONEY-SAVERS BECAUSE THEY'RE "CUT-OFF-ABLE" AS WELL AS "REVERSIBLE"

As a Van Keuren agent put it, "They're not only reversible, they're cut-off-able." And that means when you buy Van Keuren Wire Type Plug Gages, the sizes below 3½" may be cut off when ends become worn and as many as from five to ten gages made available from the 1½" and 2" long units. It is not only economical and practical to use Van Keuren Gages but it is a very simple operation to cut off the ends by following instructions furnished on request. The illustration above shows clearly the cutoff and reversible features.

VK Wire Type Gages are available in ZZ to XXX accuracies in sizes from .001" to 1.000". They are furnished in alloy tool steel, high speed steel, chromium plate or tungsten carbide. Whatever the gaging job, the extra length provided in VK units will save you money. It will also pay you to take advantage of VK deliveries. In many cases we can ship your requirements from stock.

VK Wire Type Plug Gages are fully described in Catalog & Hand Book No. 36, available on request.

Send for a capy of the new, 258-page Van Keuren Catalog and Handbook No. 36 containing valuable technical and engineering information on measuring problems and methods. Address:



THE Van Keuren co.

177 WALTHAM STREET, WATERTOWN, MASS.



bulletin published by Roller Bearing Co., of America, Dept. BB, Sullivan Way, West Trenton, N.J. The Pitchlign superiority is said to spring from its maintenance of proper axial alignment of the rollers which is so vital when they are in the critical load zone.

31. Vibration Control. Bulletin No. 950 explains the vibration control methods of Robinson Aviation, Inc., Dept. MBB, Teterboro, N.J. The fundamental superi-

ority of Robinson vibration and shock mounts is said to result from advanced design techniques proven by years of experience, and the use of Met-L-Flex, the elastic element fabricated of stainless steel wire.

32. "Quick Facts About Republic Union Cold Drawn Steels" is the title of a new revised booklet from Republic Steel Corp., Dept. B, 3100 E. 45th St., Cleveland 27, Ohio. This illustrated 32-page

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Pedrick Production Benders offer new standards of efficiency and economy for all pipe, tube and structural bending. Even the most difficult bends can now be made on a production or jobbing basis.

Let us know your problem—and supply a cost-cutting solution.

Write Pedrick Tool & Machine Co., 3640 N. Lawrence St., Philadelphia 40, Pa. Dept. 3.





FREE "PEDRICK LINE" BULLETIN. WRITE TODAY.

PEDRICK

production benders

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booklet summarizes the cold drawing process, and presents basic information on commercial cold finished products. Other sections of the booklet are devoted to shafting, special sections, furnace treatment and carbon correction.

33. Drills and Taps. Catalog No. 55-1, published by the Regal Div., Beloit Tool Corp., Dept. TBM, Beloit, Wis., describe and illustrate their line of taps, drills and gages. Thread dimensions and

rake angles as well as the indexing of the cutting edges are accurately controlled on all tools. Regal taps are manufactured from high speed steel, and are precision machine ground after heat treating.

34. Honing Machines. A new 8-page booklet is now available, describing Sunnen honing machines and their applications. The booklet explains honing, compares it with other metalworking



No ordinary bench drilling machine, but an extremely accurate, high speed, sensitive machine for precision drilling. Drills from "4" down to extremely small sizes. Successfully used down as far as .008".

Table and column exactly squared, one to the other, and built with strength and rigidity for maintained accuracy. Hardened and ground spindles insure long life. Sealed ball bearings throughout for smooth operation from 4,000 r.p.m. to 10,000 r.p.m. Motor, driving belt, and spindles entirely enclosed for safety. Available with 1, 2, 3 and 4 spindles.



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PRATT & WHITNEY

Division Niles-Bement-Pond Co. - West Hartford, Connecticut

18G5#

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The cutting of Titanium with Allison abrasive wheels is comparable in speed, quality and economy with that of cutting most grades of steel.

for cutting Titanium, as well as many of the tough "new" high-temperature-resistant alloys.

Tough Cut-Off Jobs Are Easy . . . with Allison.

YOURS TOO CAN BE POUTINE

The best way to cut many materials . . the only way to cut some.

ABRASIVE CUTTING WHEELS

THE ALLISON CO., 264 ISLAND BROOK AVENUE, BRIDGEPORT 8, CONN.

LAL54B

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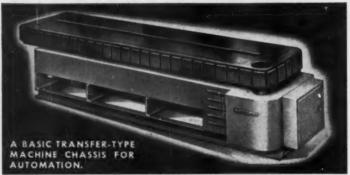
221

methods, and tells where and how honing can be used profitably. The principle of Sunnen honing is described and illustrated, and exclusive machine features are discussed. The new booklet, Form X-Man-5000F can be obtained from Sunnen Products Co., Dept. BB, 7910 Manchester, St. Louis 17, Mo.

35. Engine Lathes. An illustrated 16page brochure that describes the Demoor Engine lathe is available from Stokvis-Edera & Co., Dept. TMB, 18 Secatoag Ave., Port Washington, N.Y. Complete details are given, including close-up views of various components, explanation of controls and specifications for ten models in the line.

36. Heat Treating. "Heat Treat Review," published by Surface Combustion Corp., Dept. BB, 2375 Dorr St., Toledo 1, Ohio is now available. It features an article on Efficient Fixturing for increase of

Swanson Aunounces... the AUTO-TRAN unit



This versatile, transfer-type indexing chassis is available in standard models with 48, 54, 60, 66 or 72 carriers; 3", 6", 9" or 12" index travel; vertical or horizontal mounting surfaces on carriers.



also offers standard turret indexing units, with turret diameters from 20" to 72" and a complete range of indexing rates and dwell times. If an automation program is in your plans, write, wire or phone for full details on these Swanson standard components.



ENGINEERS AND BUILDERS OF AUTOMATIC AND SPECIAL PURPOSE MACHINES

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You are missing real values if you're not using

ACE Superior DRILL BUSHINGS

Full Polished Radius, Super-Finishes, Maximum Concentricity, Controlled Hardness for Long Life, Highest Quality Steels, Consistent Tolerances, More Distributors, Larger Available Selection, Faster Service, More ACE Standards-Less Specials, Simplified "Size-or-Symbol" Ordering.

ACE DRILL BUSHING CO., INC.

Write For Catalog No. .

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ARE YOU VOUR DRILL BUSHING

DOLLARS?



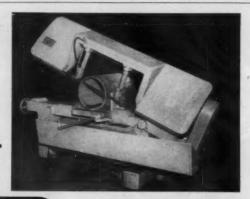
furnace versatility and economy. Illustrated examples of fixtures and ways are included. Complete heat treat plants with standard equipment and other editorials pertaining to cost-saving applications of modern furnaces are included.

37. Shaped Tubing. Shaped tubing is illustrated and described in Data Memorandum No. 17, just published by Superior Tube Co., 1572 Germantown Ave., Norristown, Pa. Cross sections in-

clude squares, rectangles, hexagons, flat ovals, ellipticals, and partial rounds. Step taped tubing, for such applications as antennas, golf shafts and fishing rods, is also described. Shapes of mechanical tubing for bushings, punches and machine parts are illustrated.

38. Lubricants. Motor-Mica protects a bearing surface against wear and the damaging effects of heat and friction. It provides a silvery, slippery and virtu-

MODEL 1220



KALAMAZOO

BAND SAW

big, rugged, built for heavier production

MODEL 8C Cuts 8" round, 16" flat, 8" pipe.

MODEL 610 Cuts 6" round, 10" flat.

KALAMATIC AUTO-MATIC BAR FEED ATTACHMENT for Kalamazoo Metal Cutting Band Saws. Cuts 12" round, 20" flat stock. Accurate to thousandths of an inch, minimum burr and kerf. Four cutting speeds, four blade-tension adjustments for better sawing, longer blade life. Safety-designed throughout—only cutting section of saw blade is exposed. Positive power from heavy duty 1 HP motor. Available with coolant equipment.

Ask your dealer for details and demonstration.

MACHINE TOOL DIVISION

Kalamazoo TANK and SILO CO.

1232 HARRISON ST., KALAMAZOO, MICHIGAN

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MACHINE and TOOL BLUE BOOK

YOU CAN PRODUCE SMALL INSTRUMENT PARTS

ACCURACY · ECONOMY and SPEED



TEVIN . TURRET LATHES

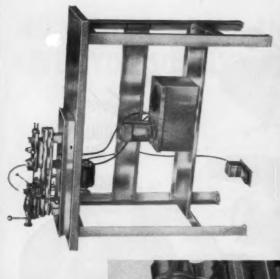
The cross slide has a swivel slide at one end and a rigid tool block at the other. Lever collet closer provides quick opening and closing. A variety of turret tools with 1/2" shanks is available.

Send for catalog M describing complete line of instrument lathes, microdrilling equipment and accessories.

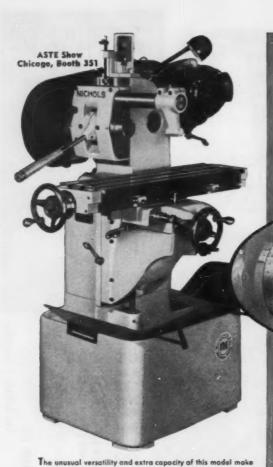
LOUIS LEVIN & SON, INC.

3610 South Broadway

Los Angeles 7, California







it extremely useful for the tool room. Because it is equipped with the "rise-and-fall" spindle, it can perform not only conventional precision milling, but also facing boring, key seating, contour milling and other operations. Both longitudinal and transverse

feed screws are fitted with hand wheels and extra-large adjust-

able micrometer dials with easy-to-read graduations. This model

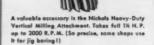
is especially useful because of its compactness, generous capacity

and ability to handle a wide variety of work to close tolerances

- to "tenths" when desired!

Vichols
TOOL ROOM
MILLER

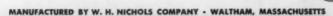
"the miller that uses its head!"



CONDENSED SPECIFICATIONS

CONDENSED SPECIFIC	CATIONS	
Table Working Surfece	816" x 30"	
Longitudinal Travel	19**	
Transverse Travel	7"	
Vertical Travel - Knee	13%**	
Rise and fall of Spindle	4%**	
Selective Speed Renges up to 5	1000 R. P. M.	
Weight	1250 fbs.	

Write today for Nichols general catalog which describes the six models of Nichols Millers. A sound, color movie, "the Miller that Uses its Head" is available for free showing. May we reserve it for you?



NATIONAL DISTRIBUTORS NICHOLS-MORRIS CORPORATION

8-6 MANARONECK AVE. WHITE PLAINS, H. Y.

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MACHINE and TOOL BLUE BOOK

NO OTHER DRILL IN ITS RANGE GIVES YOU SO MUCH FOR THE PRICE!

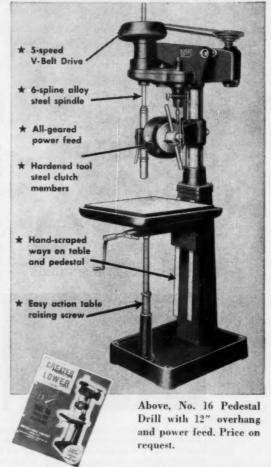


No. 16 DRILL

"Proven in Production"

Check price, design, and standard of construction—you'll find this \(\frac{7}{8} \)" capacity drill a top value. No, you won't find fancy chrome trim or costhiking gadgets—but soundly engineered features like those shown here—features that make drilling easier, that promote accurate work and that add years to the drill's useful life. In short, features that cut your drilling costs.

Write today for details, including Bulletin 2730G, and see why more and more users every day are calling the "Buffalo" No. 16 their best buy!





BUFFALO FORGE COMPANY

161 MORTIMER ST.

BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

LING . PUNCHIN

SHEARING

BENDING

Encircle No. 360 on Card, Opposite Page 65

227

ally frictionless film to the bearing surface that cannot be obtained any other way. Fills up tiny marks and scratches in the bearing surface. Makes hot bearings run cool. Scientific Lubricants Co., Dept. B, 3469 N. Clark St., Chicago 13, Ill.

39. Parts Feeders. A new bulletin published by Syntron Co., Dept. TMB, Box 220, Homer City, Pa., describes and illustrates the Vertical-Vibratory parts

feeders that are said to provide automatic, oriented position, single line feeding of vari-sized and shaped parts. Syntron feeders were developed to provide automatic feeding of small parts to various automatic machines, without the labor cost involved in hand feeding.

40. Cutting Tools. A new bulletin is available from Spiral Step Tool Co., Dept. B, 5400 N. Damen Ave., Chicago 25, Ill., describing and illustrating their



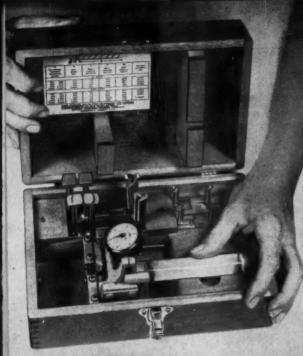
Light up machines and benches at rock-bottom cost and get Dazor dependability besides. New Adjustable-Arm Lamps mount solidly, hold fast in any position set. Either top- or side-mounted reflector. Air-cooled housing is safe to handle despite continuous use. Gray baked enamel over bonderizing. Call your Dazor distributor. Dazor Manufacturing Corp., St. Louis 10, Missouri.

... Makers of

DAZOR FLOATING LAMPS

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MACHINE and TOOL BLUE BOOK





GROOVE GAGE



One low-cost kit checks all standard grooves through 5"!

• The Bryant groove gage offers incomparable accuracy and speed at <u>low cost</u>. No bearings or slides to wear — (no scissors action).

 Complete kit includes four pairs of segments to check "O" ring grooves through 5" dia. and four pairs of segments to check snap ring grooves through 5" dia. — immediate delivery from stock.

Segments for checking special grooves available.

Bryant bench-type gages to measure internal threads, external threads and squareness of face as well as portable gages for checking internal threads are also available.

Bryant Gage and Spindle Division . Division of Bryant Chucking Grinder Co., Springfield, Vermont, U. S. A.

Bryant Gage and Spindle Division, P.O. Box 620E, Springfield, Vermont, U.S.A.

Gentlemen: Please send me more information on Bryant Gages.

 Name
 Street

 Title
 City
 Zone

 Firm
 State

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FREE



The Visual Gage being used to check O.D.



Measuring the pitch diameter of tapered threads.

Using the sine bar fixture to check taper



Prove to yourself the live of the Visual Gage right there is your own shap. You won't be obligated in any way

See how simple it is—how fast—how sensitive—how positive—how rugged—and how easy to read.

See how many ways you can apply it to the precision work you are doing in the toolraam and in the stop.

The Visual Gage will with suitable accessories readily check angularity and any austide dimension including screw thread characteristics

N you are working to "Tenths", ask for a Yound Gage having an amplification of 1000 to 1. If your tolerances are as small as sen millionths, ask for an amplification of 10,000 to 1. You have a choice of 3 amplifications.



THE SHEFFIELD COMPORATION
Box 893—Daylon 1, Onio Date

Without obligation, we'd like to try a VISUAL GAGE in the shops.

Mana

Sompony

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MACHINE and TOOL BLUE BOOK

THE CORRECT BLANCHARD WHEEL

GETS YOUR NOSE OFF THE GRINDSTONE

... WITH BEST SURFACE GRINDING RESULTS!

BLANCHARD SURFACE GRINDERS give you peak production and economy when maintenance is performed on schedule, and when you use the best wheel for each job.

For more than 25 years, Blanchard has been making wheels that do their jobs in less time, with less trouble and cost... whether the work is tough as copper or fragile as glass... whether it requires heavy roughing cuts or clean-up cuts with flatness of .000005" to .000010" and finish of 1 to 3 micro-inches.

Our quarter century of experience has proven that Blanchard grinders perform best with Blanchard wheels...on every job!

FOR OUR NEW, FREE FOLDER on Blanchard cylinder, sectored and segment wheels in silicate, resinoid

and vitrified bonds.

PUT IT ON THE



THE BLANCHARD MACHINE CO. 64 STATE STREET - CAMBRIDGE 39, MASS., U. S. A.

Gentlemen:

TITLE

Please send new Blanchard Wheel and Segment folder.

NAME_____

FIRM

STREET

CITY_____ZONE__STATE

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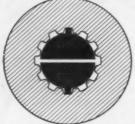
line of Spiral Special cutting tools. Described is their line of step drills; counterbores; form cutters; special reamers; trepanning tools; circular form tools; dovetail form tools; end cutting form tools; and form grinding with radial relief.

41. Inspection Equipment. George Scherr Co., Inc., Dept. MTB, 200 Lafayette St., New York 12, N.Y., makers of a complete line of precision instruments, has

published a new catalog describing and illustrating their line of inspection and measuring equipment. The Scherr Co. has developed instruments that are in the price range of every shop where close tolerances must be observed.

42. Shop Equipment. A new bulletin published by Standard Pressed Steel Co., Dept. BB, Jenkintown, Pa., describes and illustrates Standard's steel shop equipment. Described are: acabinet

FOR GAGING SPLINE ROOTS Both Odd and Even Tooth



3.11

With modifications standard Comtorplugs solve many spline gaging needs including pitch diameter or clearance.

State your problem - - let us help.

COMTORPLUG with interchangeable expanding plugs to gage simple or special bores from 1/8"

UNIQUE ADVANTAGES

Positive gaging accuracy to fraction of .0001" regardless of who operates it.

indicates actual size, a fixed net passing—reading. Positive 2-point gaging — automatic centering.

Shallow heles, deep holes, inside splines, open-end holes gaged easily.

Detects evality, back or front taper, bell mouth, barrel shape. Reaches to bottom of blind beles. Gages work while still held in shuek.

A shop tool for all-day every day use. Portable — no wires, hoses or

Portable — no wires, heses e stands. Investigate the gage used by the thousands in jet engine, guided missile, farm machinery, automotive transmission, household appliance, and other volume-precision plants. IT MAKES PRECISION GAGING EASY . . . at machine . . . at inspection bench . . . for selective assembly. No other like it—investigate and see why.

COMTOR CO. 62 Farwell Street

Waitham 54, Massachusetts



GET THE FULL FACTS - REQUEST BULLETIN 48

Tough grinding jobs? Check Vulcanaire high speed precision grinding heads!

Many seemingly impossible grinding problems have been solved by adapting Vulcanaire to standard machines or by using one of Vulcan's specially designed machines.

On Surface Grinders, merely remove wheel and guard, clamp vertical or horizontal adaptor to machine as illustrated. No belts necessary. For instance, Vulcanaire used in connection with Vulcan's Rotary Table for Surface Grinders permits the grinding of a circular slot.

Adaptors are in stock to fit the spindle of Vertical Milling Machines for grinding contours, holes and slots.

On Internal Grinding Machines Vulcanaire's infinitely controlled speeds furnish the correct surface cutting speed resulting in faster production and micro finish. The adaptor sleeve fits into present housing.

Applied to Jig Boring Machines, Vulcanaire is liked by leading precision manufacturers because its accuracy is guaranteed, producing Vulcanaire jig grinding of large and small parts.

Send us a blue print on your toughest grinding problem. Recommendations and sketches will be returned to you—no obligation.



Grinding circular slot using Vulcan's Rotary Table and Magnetic chuck.



Vertical adaptor for Surface Grinders. Grinding small slots



Horizontal application Grinding a Shoulder Punch.

Major Vulcan Services

Engineering, Processing, Designing and Building . . . Special Tools . . . Dies . . . Special Machines . . . Vulcamatic Transfer Machines . . . Automation . . . including the Vulcan Hydraulics that Form, Pierce, Assemble and size. Vulcanaire Jig Grinders . . . Motorized Rotary Tables . . . Plastic Tooling.



Verson standard press brakes, Model 16-48 with 16 ga. by 48" capacity priced at \$1,455.00* and Model 1062 with 16 ga. by 78" capacity priced at \$2,190.00*, are immediately available from stock! There are no involved proposals, no long waits . . . it's as simple, quick and convenient as ordering from the corner grocer . . . Verson standard press brakes right "off the shelf."

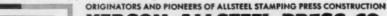
Write for complete spec sheets on either model. Then just place your order.

*FOB Chicago, less dies

New, Improved, Fully Enclosed VERSON SHEET FLOATERS

Easiest, most economical way to separate steel sheets and blanks. Available in 3 models, each with 7 sizes. Write for descriptive literature and prices.

A Verson Press for every job from 60 tons up.





SON ALLSTEEL PRESS CO.

9303 S. Kenwood Avenue, Chicago 19, Illinois So. Lamar at Ledbetter Drive, Dallas, Texas

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES
TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

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CAMPBELL Abrasive Cutting is **SMOOTH** cutting -high quality at low cost

 Almost any type of material. Engineers will show conclusively whether hard or soft, can be eco- which abrasive cutting machine will nomically cut by CAMPBELL Abra- do the most economical job on your sive Cutters. The excellent finish cutting application. Latest type obtained eliminates milling or other CAMPBELL machines are available finishing operations in most cases, to save you time and money on Testing procedure by CAMPBELL every type of cutting operation.



Let us send you Bulletin DH-301 on "Principles of Abrasive Cutting"

Campbell Machine Division AMERICAN CHAIN & CABLE

937 Connecticut Avenue, Bridgeport 2, Connecticut



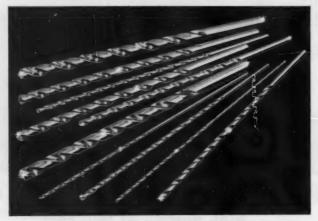
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benches; steel work benches; multiple unit benches; work benches; stools and chairs; drawer tiers; and steel carts.

43. Chucks. The Skinner Chuck Co., Dept. TBM, New Britain, Conn., has literature available describing their 4-jaw independent chucks; 3-jaw self-centering scroll chucks; power or air chucks; machine vises; 3 and 4-jaw light duty chucks; and the non-rotating power chuck fixture. The Skinner non-

rotating 8", 10" or 12" air chuck is selfcentering and available with either two or three jaws.

44. Products and Services. A new general catalog has been published by The Sheffield Corp. Dept. TBM, Dayton 1, Ohio, manufacturers of precision products and services. Described are: machine tools; Precisionaire gages; Plunjet gaging cartridges; multiple-dimension gages; visual and limit-type gages;



Now! Drill deep holes without costly "Specials"!

ACE WINGS

If you've been investing a lot of money in "specials" for deep hole drilling operations, then here's good news for you! Ace Drill Distributors now carry, in standard stock, a complete line of 12" Longboy drills . . . ready for immediate delivery! And, in many instances, you'll find that an Ace Longboy can be a big improvement over a costly "special"! The polished flutes are precision ground into a properly hardened high speed steel bar, producing a finer finish and keener cutting lips. And the result? Greater production, longer tool life, lower operating costs.

A 56 PAGE, illustrated catalog (No. 52-G) containing complete information on the entire line of ACE Drills and hardened H. S. S. drill blanks is yours for the asking. Send for it today!



ERKINS__ OWER PRESSES

FOR HIGH PRODUCTION

Use the right type of press for your work,

We show a few of the many styles of presses available. We offer you presses with specifications to meet your particular requirements at standard prices. Presses equipped with the latest developments in air operated clutches for maximum production and speeds. Single and double feed rolls and dial feed attachments for safe, automatic fast production.

Address all inquiries to Dept. MB-12

PERKINS

MACHINE COMPANY Warren, Mass., U.S.A.





2H Plain Press Double Crank



Junior Press with Roll Feed



450B With Air Clutch and Feed Rolls



550B Standard Press



12-H-36 Plain Press with Air Clutch. 200 Ton Cap



NEW 2 AAT Transfer Press

PRESSES BUILT TO SPECIAL SPECIFICATIONS

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toolroom instruments; lead measuring instruments; automation gages and machine control units; automatic gaging machines; standards laboratory; contract services.

45. Hack Saws. Bulletin No. 655, describing and illustrating Keller power hack saws, is available from Sales Service Machine Tool Co., Dept. B, 2363 University Ave., St. Paul 14, Minn. The major change is in the capacity range

of these saws, which is now from 4" x 4" to 10\%" wide by 9" high. The model 3CH, model 4 and model 5 are equipped with adjustable feed control.

46. Precision Tools. Scully-Jones and Co., Dept. BB, 1901 S. Rockwell St., Chicago 8, Ill., manufacturer of precision holding tools, has published bulletin 6-50 which contains information on some of the precision tools available for multiple-spindle machines. Various



Polishing metallic sealing rings.

- Automatic, high speed lapping and polishing of parts, samples, etc.
- Produce perfect scratch-free finishes in one-third the time.
- Eliminate use of expensive polishing wheels—practically no rejects.

New Syntron Lapping-Polishing Machines are completely automatic. Driven by variably controlled electromagnets, they assure a positive, even polishing action on practically any part or sample where microscopic finishes are required. No expensive installation or grinding equipment required.

Write For Complete Catalog Data—

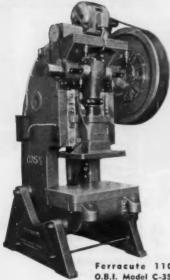
SYNTRON COMPANY

300 Lexington Ave. Homer City, Pa.

NEW! SYNTRON LAPPING \ POLISHING MACHINES



Need a Punching Press in a hurry!?



rracute 110-ton O.B.I. Model C-35 1/2 with Single-Point Adjustment on Air-Friction Clutch.

All models up to 110 tons available for prompt shipment. Some sizes, immediate shipment. Complete line includes models to 200-ton capacity.



Ferracute Geared Type PG Press



FERRACUTE MACHINE CO

Manufacturers of Power Presses and Special Machinery • BRIDGETON, N. J.

applications are described for: quick-lock adjustable adapter assemblies; quick-lock adjustable adapter bodies; quick-lock nuts; spindle extension assemblies; and Toolitrol boards and gages.

47. Marking Tools. Geo. T. Schmidt, Inc., Dept. MTBB, 4100 Ravenswood Ave., Chicago 13, Ill., illustrate their slogan "If It's Worth Making, It's Worth Marking" in their new No. 11 brochure, "Marking Tools and Marking Equipment." This 15-page brochure illustrates and explains marking tools, from hand stamps to automatic marking machines, the products on which they are used and various fixture set-ups for marking operations.

48. Production Tools. Sheridan Products, Dept. B, Inglewood 3, Cal., has published a new production tool catalog. This catalog of descriptive information,



The compact, simple design of all Gusher Coolant Pumps assures you of maximum performance in a minimum of space. Wherever you mount it, a Gusher Coolant Pump is ready to go to work. There's no priming necessary, you get instantaneous coolant flow.

Gushers require little or no maintenance, the ball bearings are pre-lubricated. There is no packing to worry about and the rugged construction and dynamically balanced rotating assembly cut wear to a minimum. Always specify Gusher for your coolant needs. Illustrated is a Hammond Model 14-WD Wet or Dry Carbide Tool Grinder— the inset shows a Gusher Coolant Pump mounted inside the base.

THE RUTHMAN MACHINERY CO.

Encircle No. 373 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

for more Accurate cuts...
greater Rigidity in

BORING



Use CRITERION BORING EQUIPMENT

BORING PROBLEMS? CLOSE TOLERANCE?

Try Criterion Boring Tools. Built with the same care and quality as the time-tested Criterion Boring Head.

THIS COMBINATION WILL PRODUCE RESULTS.

Boring heads from 1½ to 7 inch diameter. Boring tools, carbide or high speed steel, % to 1% inches diameter. Bore holes from % to 20 inch diameter.

Accuracy for the closest tolerance • Rigidity for the heavy cuts • Heat-treated parts for long wear

LARGE OFFSET SAVES TIME AND

CRITERION MACHINE WORKS These tools will cut your boring costs.

See the complete line of CRITERION TOOL PRODUCTS at your local dealers or write for free catalog.

765 W. 16TH ST., COSTA MESA, CALIFORNIA

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prices and technical data describes and illustrates quick change pressure foot; adapter—hand drill motors; adapter—drill press; drill guides; chip chasers; rivet finishers; detonating units; friction detonator; B-K No. 7 cement and B-K No. 7 catalyst; and price sheets.

49. Metal Working Machines. Tech-Pacific, Dept. MTBB, 2811 Lafayette, Newport Beach, Cal., has literature available describing and illustrating their G-V Metal Worker, model 155A, model 285B, and model 400B. Specifications and capacities are included for these machines that are used for straight cutting; circle cutting; figure cutting; beading; folding; slot cutting; louver forming; nibbling; planishing; and flanging.

50. Grinding Wheels. Catalog No. 1-55, published by Sterling Grinding Wheel Co., Dept. B, Tiffin, Ohio, describes

IMPROVED PALMGREN



The No. 86 Rotary and Indexing Table by Palmgren has been a basic tool for years, and now with these new improvements it is even more essential than ever in lowering costs and increasing production in every metal working or wood working shop. Check these features: 8" dia. top with 5%" x 1" x 5/16" T slots. Rotary Top graduated to full 360° with rotary feed positive through worm and gear with ratio of 40-1. Rotary indexing dial accurately graduated in three minute intervals. Two hold down screws furnished to lock table top in position after indexing. Overall height is only 31/4" which makes the No. 86 an ideal tool for jobs where the fixture is large and takes up too much distance between the spindle and the machine table. Two 5/8" keys and screws are provided for machine mounting. Ruggedly built for years of precision

64 different models and types of vises, rotary tables, milling attachments, and other machine tool accessories. Write for Catalog #203. \$**599**5

CHICAGO TOOL AND ENGINEERING CO.

8364 South Chicago Ave. . Chicago 17, Illinais

Encircle No. 375 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

NFFD HFIP

In Cutting Holding Tool Costs?

SEIBERT SHUR-LOCK ADJUSTABLE ADAPTERS

Better production machining methods at Seibert today make it possible to manufacture, in quantity, holding tools of improved quality without increased cost to you. The Seibert Shur-Lock adjustable adapter is one illustration. They are manufactured to precision tolerances from the highest quality hardened alloy steel, to give you the best in holding tools - certain to cut set-up time and give long service life. In addition, they are produced more efficiently than ever before which makes it possible to supply your needs promptly and at reasonable cost. Quality, Service and Price are the three reasons hundreds of users are today specifying Seibert tools. It will pay you to investigate the advantages of standardizing with Seibert.

WRITE TODAY FOR FREE ADAPTER BULLETIN AND LATEST PRICE LIST

Drop us a line today and ask for Folio 2-50 and a Price List - or, ask to have a Seibert representative call at your plant soon to check over your tooling problems. There's no obligation.













Tension and Compression Top Drivers

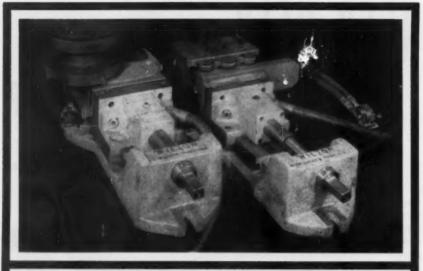




SEIBERT & SONS, INC. CHENOA, ILLINOIS

Quality MULTIPLE DRILL SPINDLES AND PRODUCTION TOOLS

Encircle No. 376 on Card, Opposite Page 65



BEAT THE TIME CLOCK WITH "M-M"

Cut loading time 80%, turn out more work more economically with Wilton's fully automatic MilOmatic "MM" air-powered hydraulic vises. By using specially shaped jaw inserts you can make tooling changes quickly and practically eliminate costly fixtures. Start using the "MM" NOW to increase milling, drilling, shaping, and broaching output—and cut tooling costs in YOUR plant!

ATTACH THIS AD TO YOUR LETTERHEAD AND MAIL TO US FOR A
FREE 10 DAY TRIAL OR FREE LITERATURE!



"The Finest Name In Vises"

WILTON TOOL MFG. CO., INC.

SCHILLER PARK, ILLINOIS



Alr-Hydraulie Bench Vises



Manual Machine Vises



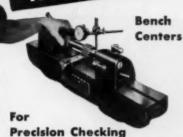
Continuous and Automatic Clamps



PowRarm Work Positioners

Time Saving Production and Checking Accessories

Here are three Sundstrand accessories that may prove helpful in your work. A wide range of bench centers and balancing tools are available for checking purposes. The automatic index base has proved a sound addition to many metal working machines. Write for further information.



Simplify assembly, lower spoilage and get better production from this modern Sundstrand Bench Center. You'll check work between centers easier, faster and within limits of .0001" on this improved Sundstrand Bench Center.

COMPLETE RANGE AS FOLLOWS:

6"	x 18"	12" x 48"	24" x 48"
6"	x 36"	12" x 60"	24" x 60"
12"	x 36"	12" x 72"	24" x 72"

Balancing Tools For Small



Medium or Large Work

Sundstrand offers a complete line of balancing tools which will save their cost quickly on truing or balancing operations. Accurately sensitive and durable, they provide a simple, reliable means for checking the balance of parts like gears shafts, fly wheels, pulleys, etc. Standard swing sizes range from 21 inches up to any swing desired. Length between standards ranges from 20 inches to any length desired.

Automatic Index Base For More Production



This automatic index base is designed so there is no strain against the index plunger during the cut. The base is locked by powerful clamping so that accuracy of index is not affected by heavy cuts.

In many cases, the addition of this Automatic index base has increased milling production enough to eliminate need for the purchase of additional machinery. It may be the answer to your milling production requirements. Call in a Sundstrand engineer. There is no obligation for this.

Free Data

Complete specifications are available on these three time saving accessories. Write for your copies today. Ask for bulletin 463



SUNDSTRAND

SUNDSTRAND MACHINE TOOL CO.

2535 ELEVENTH ST. ROCKFORD, ILLINOIS, U.S.A.

and illustrates stock abrasive items and gives list and net prices. This catalog is said to be a quick means of making selections of the proper grinding wheel to be used on the more common operations. Since these items are factory stocked, fast delivery is assured.

51. Needle Bearings. A comprehensive new catalog conveniently presenting design, application and use data for five types of needle bearings has been published by The Torrington Co., Dept. BTM, Torrington, Conn. The No. 55 needle bearing catalog is organized and coded to speed bearing selection to enable engineers to easily select the correct needle bearing for a specific installation.

52. Tapping Attachment. Tapmatic Corp., Dept. B, 845 W. 16th St., Costa



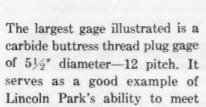
Encircle No. 379 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

True Economy in Thread Gaging

Calls For

Lincoln Fark

CARBIDE THREAD PLUG GAGES



special thread gaging requirements. Or, when customers' needs are for standard carbide thread gages, Lincoln Park offers a complete range of types and sizes.

The manufacture of thread plug gages has been a Lincoln Park specialty for many years. In fact, this company was the first to successfully utilize cemented-carbides for such products. It is this unequalled experience that assures you of gages of unquestioned accuracy and maximum service life.

Let us send you full information on Lincoln Park thread plug gages produced in carbide—or in steel.

Lincoln Fa

INDUSTRIES, INC.

Encircle No. 380 on Card, Opposite Page 65

Mesta, Cal., has published a new bulletin describing and illustrating their Tapmatic tapping attachment. The Tapmatic combines weightless floating action with positive torque control to give longer tap life; less tap breakage; consistent uniform threads; less work spoilage; and faster tapping production.

53. Lubrication. A number of bulletins are available from Trabon Eng. Corp., Dept. MBT, 1814 E. 40th St., Cleveland 3, Ohio, describing and illustrating their line of lubricating pumps and systems. Trabon oil and grease systems have one indicator at the pump, which is claimed to assure the proper measured amount of lubricant to each point. All Trabon systems are sealed, with no exposed parts to collect dust and dirt.

54. "Eleven Ways To Avoid Boiler Tube Corrosion" is the title of a new publication by the Tubular Products Div. of The Babcock & Wilcox Co. This 8-page folder contains important data resulting from an extensive study on the part of the metallurgical staff. Many of the causes of corrosion in boiler tubes is explained in detail along with suggested methods of eliminating these same causes. Request bulletin TR-537.

55. Tool Holder. The new tool holder and cutter catalog is available from The Viking Tool Co., Dept. BB, Shelton, Conn. Included in the catalog are the two lines of milling cutters, carbide and high speed steel. Any cutter style may be obtained with either of these two types of blade materials. The tool holders described feature the patented Viking chip control block with a fully adjustable chipbreaker. Also illustrated are special cutters and holders with the wedge lock design.

Expect More with a ROUSSELL

ose strength where it counts...

ose accuracy where it's needed...

ose simplicity where it helps...

...to turn out first rate work FAST with steady, dependable regularity

You'll like the economical run-of-job cost, the simpler maintenance, the easier set up and operation and the wider variety of work each one can handle. And YOU'LL LIKE THE PRICE when you compare Rousselle specifications and quality . . . Ask for condensed catalog.



SERVICE MACHINE CO.

Mfrs. of Rousselle Presses 2310 West 78th Street - Chicago 20, Ill.



DESIGN NEWS

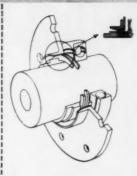
News of Design Problems Solved with Flame-Plating

Flame-Plating solves "Fretting Corrosion" problems

When tightly fitting parts undergo a vibratory motion, surface failures often occur. One name for this phenomenon is fretting corrosion. In certain cases, where parts are required to operate with little or no lubrication, the effects of fretting corrosion are quite severe. Such was the case of the turbine aircraft engine shaft seal illustrated to the right. This design problem was solved by Flame-Plating the bearing surfaces with tungsten carbide. These Flame-Plated parts now give over twice the required service life.

Flame-Plating is Linde's service performed in Linde's plants for depositing a tungsten carbide coating on metal parts. Finished or semi-finished parts made of most metals can be Flame-Plated without distortion as the temperature of the part being plated does not exceed 400 deg. F.

Find out if Flame-Plating can solve your wear problems by calling your nearest Linds Office today. Or write for your copy of the Flame-Plating booklet.





Fiame-Plating solved the fretting corrosion problem which adversely affected the performance of the above turbine shaft seal.

LINDE AIR PRODUCTS COMPANY

A DIVISION OF UNION CARBIDE AND CARBON CORPORATION

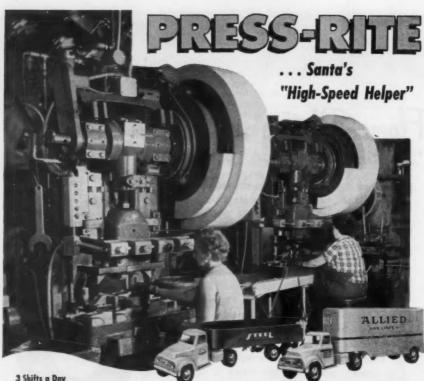
30 East 42nd Street, New York 17, N.Y. Tool Offices in Other Principal Cities
In Canada: LINDE AIR PRODUCTS COMPANY
Division of Union Carbide Canada Limited, Toronto

T

design with
Flame-Plating
in mind

"Linde" is a trade-mark and "L" is a service mark of UCC

Encircle No. 382 on Card, Opposite Page 65



3 Shifts a Day Seven Days a Week that's the year 'round schedule at Tonka Toys

True-te-life truck bodies are made of 20 gauge steel drawn to a depth of 2% inches.

2% inches.
Chassis, cabs, wheels, etc., are turned out by the thousands at Tonka Toys... and each one has to be perfect to pass the critical inspection of today's boys and girls.

Press-Rite Presses do the job better

Increased Die Life... the experience of Tonka Toys proves that Press-Rite's tie rod frame design gives rigidity that really pays off in reducing costly die wear. You get longer runs between die grinds and keep dies at peak efficiency. The Press-Rite Airflex Clutch protects dies against accidental breakage as air-pressure is adjusted for-the-job and allows the clutch to slip on "double headers"

ALL-OUT PRODUCTION at the TONKA TOYS Factory

Mound Metalcraft Company, the home of Tonka Toys, is now one of America's leading toy manufacturers. Their rapid growth is symbolized by their "repeat orders" year after year for additional Press-Rite Presses.

Press-Rite Presses that's the combination that the folks at Tonka
... Airflex Clutches Toys have found gives them the highest production . . . at the lowest cost per unit.

PRESS-RITE has many exclusive features to make it today's TOP PRESS VALUE. Send for Catalog Today—get the money-saving facts on the Press-Rite Line. Speed Production and Cut Costs in your plant.

SALES SERVICE MACHINE TOOL CO.

2357 University Ave., St. Paul W14, Minn.

PRESS-RITE

OPEN BACK • INCLINABLE Power Presses
Used by more . . . for more production

Encircle No. 383 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

Brand New!

haskins.
hask AIR Grinder...
most powerful
air turbine grinder
in its class!

15.000

R.P.M. (1/5 H.P. prony brake test)

for Complete details



2645 W. Harrison St. Chicago 12, Illinois

- Permanently sealed bearings . . . never needs lubrication in air lines or grinder.
- Removable nose piece for deep grinding.
 - Gyro action of turbine holds tool steady.

Here's power—SUSTAINED POWER—like you've never experienced before in an air grinder . . . power unexceeded by any other air grinder in the same price range . . . maintains its high-speed efficiency under load! Built with a lightweight, contoured, hand-fitting aluminum housing, the Haskins

haskam Grinder handles easily, balances perfectly . . . excellent for the most precise grinding job. Complete kit includes: carrying case, adapter hose, mounted points, dressing stone and wrenches.

Encircle No. 384 on Card, Opposite Page 65

Lagar Tools HOLD YOUR WORK-AND YOUR BUSINESS!



Collet indexing fixture



Collet holding fixture



Vertical-horizontal collet fixture

ZAGAR HOLDING and INDEXING FIXTURES

Zagar fixtures offer you a most inexpensive way to machine small parts. Set-up is speeded and much special tooling eliminated. Slot milling, straddle milling, drilling, tapping and grinding of small pieces can be done most profitably with Zagar fixtures, readily available from stock.



COLLETS, PADS, BLANKS

Five types: No. 310 Zagar Master; Nos. 2 and 6 W. & S.; No. 5-C; No. 6 W. & S. pads. All but Zagar No. 310 are standard machine tool sizes. All collets are made of oil-hardened tool steel; have flat tops for locating purposes.

Write for Engineering Sheets "B-12" on each product.

ZAGAR TOOL, INC.

24000 LAKELAND BLVD. CLEVELAND 23, OHIO



Encircle No. 385 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

for High Speed - Low Cost Piercing of CHASSIS and PANELS

IN LOW TO MEDIUM QUANTITIES

the RA-41P



TURRET PUNCH PRESS

The RA-41P WIEDEMANN economically pierces chassis and panels in small to medium lots for:

COLOR TV RADAR FIRE CONTROL COMMUNICATIONS BUSINESS MACHINES AIRCRAFT

Write for Bulletin 241

and many other applications

WIEDEMANN MACHINE COMPANY

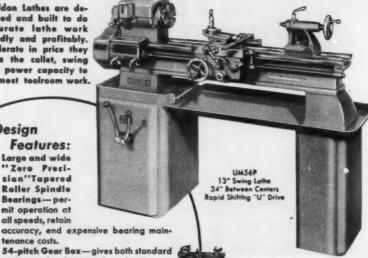
4265 Wissahickon Ave. P.O. Box 6794 Philadelphia 32, Pa. Encircle No. 386 on Card, Opposite Page 65

HELDO

BUILT

to Turn out PROFITS

Sheldon Lathes are designed and built to do accurate lathe work rapidly and profitably. Moderate in price they have the collet, swing and power capacity to do most toolroom work.



Design Features:

- Large and wide "Zero Precision"Tapered Roller Spindle Bearings-permit operation at all speeds, retain
- tenance costs. • 54-pitch Gear Box—gives both standard and many hard to get thread ratios.
- Large Micrometer Dials-Make accurate operation easier.
- Extra Collet Capacity 1 %" hole through spindles available on 10", 11" and 13" swing lathes.
- More Power to Spindle-Efficient drives with bigger motors and double neoprene cog V-belts to spindle.



include: Hardened ways, Long Tapered Key Drive Spindles, 4" D1 Camlock Spindles bed turrets, collet attachments, and other production and toolroom accessories. Lathes available with a choice of "Bench," "Cabinet" or "Pedestal" mountings.



Write for New Catalog G-55

LDON MACHINE CO., Inc.

4242 N. Knox Ave.

Chicago 41, Illinois

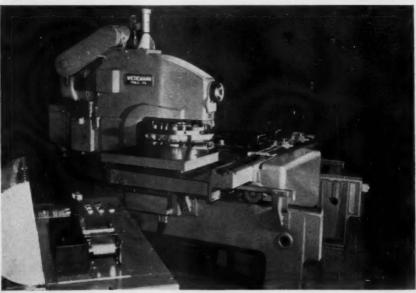


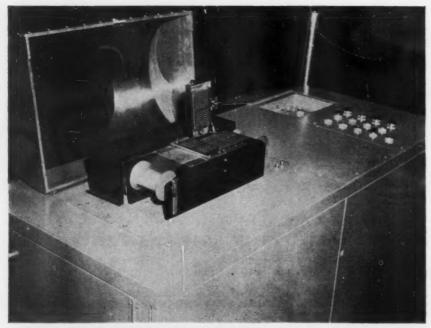


Automatic Turret Punch Press Cuts Piercing Time

The Wiedemann automatic turret minimum setup and no layout. Compunch press offers versatile tooling, plicated hole patterns are located and

1. Wiedemann automatic turret punch press. The tape fed programming control unit is shown in the foreground. This model has a capacity of 40 tons and a throat depth of 33 inches.





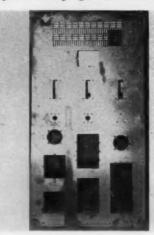
2. Close-up of the electro mechanical programming unit.

punched in large steel sheets quickly and easily. The operator merely loads the material and unloads the finished work.

The press and work locating table are controlled by a tape fed, electromechanical programming unit to perform all functions automatically—simultaneously positioning work under punch, selecting turret station carrying proper punch and die (anyone of 20 up to 6" square) and tripping the press. This cycle is repeated until all holes are located and punched.

3. This panel was pierced on a Wiedemann automatic turret punch press in only 17 minutes. There are actually three panels bolted together to demonstrate accurate duplication of complicated hole patterns. Holes of another job pierced with the automatic show through panel openings.

Setup is reduced to placing desired tape in the programmer and loading



the material onto the table. Material is positioned by the operator to mechanical zeroing stops and clamped in position in seconds.

The complete job is punched on the tape and the tape becomes the template for the job, which can be used and filed for subsequent use. The location or size of any hole may be changed simply by covering that section of the tape with a gummed sticker, and punching the new information. Any section of the tape can be removed, replaced or covered. Wiedemann Machine Co., Dept. RS, 4272 Wissahickon Ave., Philadelphia 32, Pa.

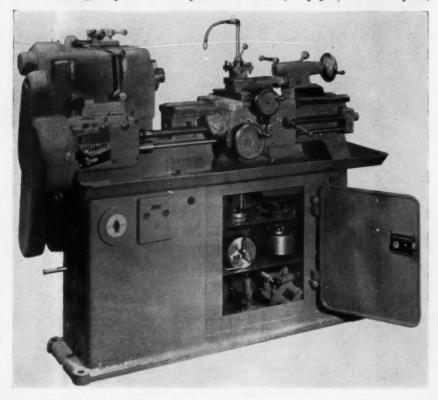
Use ACTION Card, opposite page 64. Encircle No. 1

Precision Gap Lathe

The Harrison 11" swing, all geared head, precision gap lathe has an actual swing of 11-%" over bed and 18-%" swing in the gap, 24" between centers. Machine is arranged for vee-belt motor drive including 2 hp motor with push

button starter for 3 phase ac.

Unit is complete with steel cabinet base, quick change gear box, 8 spindle speeds from 42-960 rpm and standard equipment consisting of steady rest, follow rest, chip pan, 4½" drive plate,



December, 1955

two centers, set of wrenches and instruction book.

Lathe is also available with 40" be-

tween centers. Stanley Sheppard, Dept. MG, 30 Church St., New York 7, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 2

Four New Series of Press Brakes

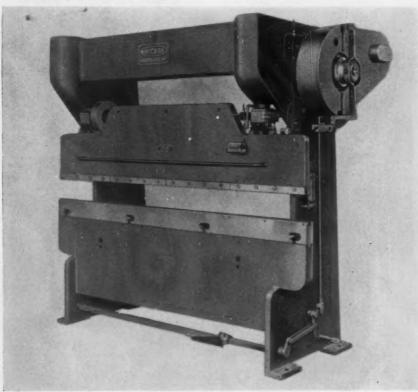
Dreis & Krump Mfg. Co., Dept. RB, 7400 S. Loomis Blvd., Chicago 36, has announced four new series of Chicago press brakes for bending and forming sheet metal and steel plate. Series A, B, C, and L.

These press brakes incorporate features for greater precision and increased production: All-steel, welded frame, and deep section bed and ram of rolled steel plate; double-end drive from the intermediate shaft. One-piece main gear and eccentric at each end rotate on hardened alloy steel shafts.

A split ram adjustment permits adjustment for tapered work. Optional features are available to meet special requirements. Capacities from 12 ga. x 48" to 14 ga. x 144".

Use ACTION Card, opposite page 64, Encircle No. 3

Dreis & Krump Series C Press Brake.





operating steps . . . Because IT'S MOTORIZED!

Here is the motorized operating procedure:

1 Place specimen on anvil or table. 2 Elevate test piece into test position. (With the new Set-O-Matic Dial Gauge, the large pointer will then automatically point to zero.)

3 Tap depressor bar to apply Major Load. When Major Load is fully applied, the Morotized Mechanism takes over-completes the test cycle

-removes the Major Load.

4 Read "Rockwell" Hardness Number. Then, lower elevating screw to remove test piece.

For complete information about the complete line of WILSON "Rockwell" Hardness Testers, write or call today. A WILSON hardness testing expert is available to consult on your specific requirement.

*Trade mark registered



Wilson Mechanical Instrument Division AMERICAN CHAIN & CABLE

230-T Park Avenue, New York 17, N. Y.

Encircle No. 388 on Card, Opposite Page 65

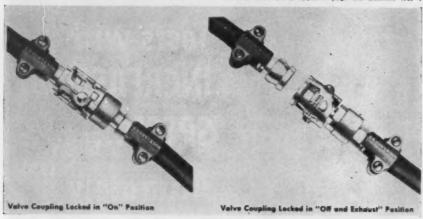
Valve Coupling

Quick-As-Wink valve couplings permit line air to be shut off and tools changed at any point.

Couplings are available in \", \", \", \", \" and \" sizes for line air up to

250 psi. Any size valve half can be connected to any size connection half. C. B. Hunt & Son, Inc., Dept. RH, Salem, Ohio.

Use ACTION Card, opposite page 64. Eneircle No. 4



In a large metalworking plant, this 21" G. & E. Shaper wasn't bolted or cemented to the floor. Today it's working like mad. They just "sat" the machine on AIR-LOC pads and pushed the START button. No bolting or waiting for cement to dry. Vibration and noise reduced, and the AIR-LOC pads can be re-used because they will not "pad down".

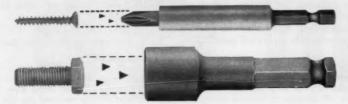




BOOKLET tells why AIR-LOC saves you installation time and money, why repeat orders from users come in every day. Write to CLARK, CUTLER, McDER-MOTT CO., Fisher Street, Franklin, Mass.

Encircle No. 389 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

an "extra hand" for your fastening operations!



*apex magnetic nut running and screwdriving tools

The small, powerful magnet in an Apex magnetic tool serves as an "extra hand" by holding the nut or screw firmly in position during the fastening operation. Even when working straight down, or in cramped areas, there's no time lost by awkward fumbling to start nuts or screws by hand.

With Apex nut running or screwdriving magnetic tools, the nut or screw stays just where it belongs—in the socket or on the tip of the bit. Apex magnetic tools are designed for use with power or manual tools. You can run hex or square nuts...you can drive Phillips, Frearson, Slotted, Clutch Head or Socket Head screws... and you can do it the quick, easy way that cuts fastening costs.

Catalog 25 lists the complete line of Apex magnetic nut running and screwdriving tools. Write, on your company letterhead please, for your copy.



fastening tools

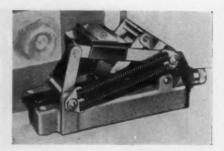
THE APEX MACHINE & TOOL CO. 1028 Patterson Blvd. • Dayton 2, Ohio

Encircle No. 390 on Card, Opposite Page 65

Automatic stock feed

The Jaco-Matic automatic feed for coiled stock up to 2" wide, with a maximum feed stroke of 2", has a micrometer adjustment to control length of feed travel to an accuracy of .001".

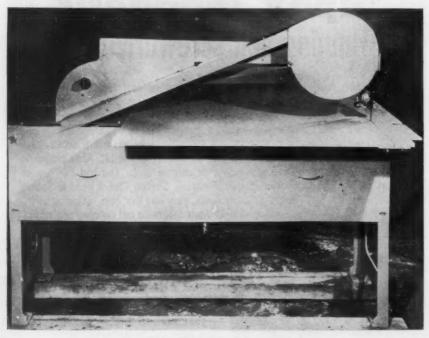
The feed is powered by the press ram and feeds on either the up or the down stroke. Its tungsten carbide steel blade normally lasts for the life of the tool because it lifts clear of the stock on the return stroke. This also permits the feed to be used for feeding soft stock without marring it. May be installed on any mechanical, hydraulic, compressed air or electrically operated press. Jaco



Devices, Inc., Dept. JP, 99½ High St., Hingham, Mass.

Use ACTION Card, opposite page 64. Encircle No. 5

This Power large throat metal band saw, using a three wheel design, has a maximum throat capacity of 72". Machine has a $\frac{1}{2}$ hp motor and V drive. Band saw may be used for all shapes of formed sections in light gauge metals as well as flat sheets, plywood, composition materials. Manufacturer is L. Power & Co., 2815 Oakford St., Dept. RS, Philadelphia 46, Pa.

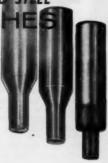




turns to PIVOT

PUNC





HOW WOULD YOU SOLVE THIS PROBLEM?

Pierce Nimonic 75 with a series of 96 holes, size .250" on a conical surface.

HERE'S HOW ROLLS-ROYCE LIMITED, Derby, England, longacknowledged world leader in automotive engineering, solved the problem. For production of a flame tube for gas turbine engines, Rolls-Royce Ltd., turned to Pivot High Speed Steel Punches.

"A substantial improvement in production figures has been obtained as the result of the introduction of Pivot Punches", the manufacturer reports.

The above experience is typical. Pivot high speed steel punches are helping firms all over the world to increase the quality and quantity of their production and decrease their unit costs.

Put Pivot Punches to work for you now. Send for complete catalog on perforating and pilot punches in all shank styles; also punch blanks, retainers and die buttons at list prices! Write Dept. M.T.



pivot punch and die corp.

NORTH TONAWANDA, N.

Satisfaction Guaranteed Trial Offer

Anderson NEW, IMPROVED HAND SCRAPER

The new Anderson Model 5-D Hand Scraper is the kind of tool you can't appreciate until you have tried it. So here's our offer: Order as many Model 5-D scrapers as you want. We'll send them promptly. Use them a full week...if they don't live up to all your expectations, send them back to us for refund.

- Faster Cutting
- Easier to Use
- . Just the Right Spring
- Palm Fitting Grip
- Light in Weight

18" — 20" — 22" lengths

- \$6.25 ... with high speed
- \$9.10 ... with carbide-
- \$1.60 ... for rubber bumper

tipped blades

ORDER AS MANY AS YOU NEED MONEY-BACK GUARANTEE

Indicate choice of high-speed steel or carboloy-tipped blades, and 18", 20", or 22" lengths. We suggest you include rubber bumpers in your order. Write today!



ANDERSON
BROS. MFG. CO.
1907 Kishwaukee St.
ROCKFORD
ILLINOIS

Encircle No. 392 on Card, Opposite Page 65

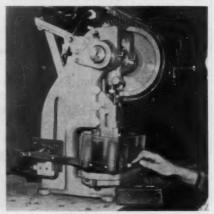
Punch press safety equipment

The Searjeant punch press barrier is so designed that it surrounds the die area when in the down position, eliminating the hazard of reaching in the ends. Incorporated in the guard is a positive electric control for the operation of the press and a built-in single stroke attachment. The downward action of the gate causes a switch to energize a solenoid that is used to trip the press.

The upward action of the guard resets a relay mounted in the control panel so that the press can be retripped on the next downward action of the gate. A fine adjustment of the guard can be obtained so that only when the barrier is within 1/6" or less of the bolster plate can the press be set into motion.

Units are available for all size presses from bench models up to presses over 100 ton capacity. For presses of approximately 30 ton and up the press clutch mechanism is activated by an air cylinder. The downward action of the guard, as it touches the bolster plate, causes the current to operate a solenoid air valve, thus operating the air cylinder. Searjeant Metal Products, Inc., Dept. MG, Mendon, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 6



MACHINE and TOOL BLUE BOOK



Here's why you get EXTRA TAPPING HOURS: heads mount rigidly eliminating chatter and vibration; sensitive friction clutch automatically regulates driving pressure; ballbearings assure smoother, longer lasting "driving"; heat treated gears with special gear reversing mechanism; unique tap holding spindle support PLUS other important features.

Write for FREE Brochure

giving complete details and specifications on the complete line of Procunier Tapping Heads.

PROCUNIER Safety Chuck Company

14 So. Clinton St., Dept. 12, Chicago 6, III.

PROCUNIER SAFETY CHUCK CO.

tap shanks. Holds tap

14 So. Clinton St., Chicago 6, Ill. Dept. 12 Gentlemen: Please and your Illustrated breshure giving complete details, specifications and prices on the improved line of Procunier High Speed Tapping Heads.

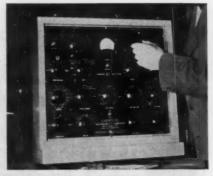
Address
City Zone State

Encircle No. 393 on Card, Opposite Page 65

Electronic machinability computer

An electronic machinability computer is reported to solve machining problems which normally take several hours to compute in less than 2 minutes with consistent and reasonable accuracy. It will enable a methods and service man to determine quickly whether or not he is using a correct set of conditions for machining a current job, help him arrive at a proper set of conditions for setting up a new machining operation. or indicate to him the relative advantages of changing some of the present job conditions to obtain greater production.

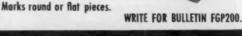
The self-powered analog unit measures 21"x7"x20", and will consider 14 operational variables in machining, such as grade of carbide, speed, feed, depth of cut, tool life, alloy, material hardness, etc.



Answers provided by the computer are based on the use of those feeds, depths of cut, proper grades of carbide and tool geometry which will result in a normal wear type cutting edge failure. Carboloy Dept. of General Electric, Detroit 32, Mich.

Use ACTION Card, opposite page 64. Encircle No. 7

All pneumatic . . . 4 tons of table lift brings part into marking position. Air cushion gently holds it while smooth marking die carriage rolls perfect marks.



THEWS

3946 Forbes Street • Pittsburgh 13, Pa.

PHILADELPHIA CLIFTON, N. J. BOSTON CHICAGO

Encircle No. 394 on Card, Opposite Page 65

Up to 800 pieces per hour on parts up to 6".

KELLER Power Hack Saws

For Top Performance
. . . at a Low Price

in a

Class

by

themselves



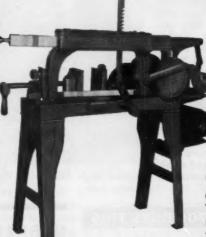
No. 4 HY-Duty Cap.: 81/2"x81/2"

10 MODELS

and

5 Capacities

4"x4"; 5"x5"; 6¾"x6¾"; 8½"x8½"; and 10½"x9"



Capacity: 634" x 634" Model 3B DRY CUT

Features Automatic Lift and Automatic Stop

Only \$205.76

Less motor f.o.b. Eau Claire, Wisc.

MOST POPULAR among the 10 standard Keller Power Hack Saws. This Model 3-B Dry Cut is the Heavy-Duty work horse in hundreds of shops coast to coast. Its wide capacity handles squares, rounds and pipe up to $64/4^{\circ}$ x6 $3/4^{\circ}$ 1 Has many plus features for faster, more accurate cutting—at low cost. Only \$205.76 less motor, and \$224.00 with motor f.o.b. Eau Claire, Wisc. Completely wired, ready to plug in.

THERE'S A KELLER POWER HACK SAW to meet every need, and every pocketbook! Write today for New Catalog No. 655 giving specifications and low prices of each model.

SALES SERVICE MACHINE TOOL CO.

2357 University Ave.

St. Paul 14, Minn.

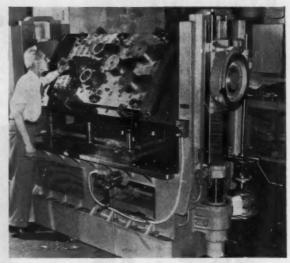
KELLER

Die Handler

The Hansford Model 1014 die handler handles dies or molds measuring 36" x 75", weighing up to 6000 lb. Its top platen is of cast Meehanite and is raised and lowered with lead screws, driven by a 2 hp electric motor mounted in the base. Under power, the top platen rises at the rate of 12 inches per minute. Fine adjustments in position can be made with an auxiliary hand crank.

The platen can be rotated with power supplied by a % hp motor. It is also equipped with an auxiliary hand crank

for rotational movement. Hansford Mfg. Corp., Dept. RH, 1239 University Ave.,



Rochester 7, N.Y.

Use ACTION Card, opposite page 64, Encircle No. 8

ONLY \$1700 BUYS THIS

ALFING DRILL PRESS

26" x 28" table

Power feed 13" throat

Nothing else like it for less than



Encircle No. 396 on Card, Opposite Page 65 268

HYDRAULIC PRESSES



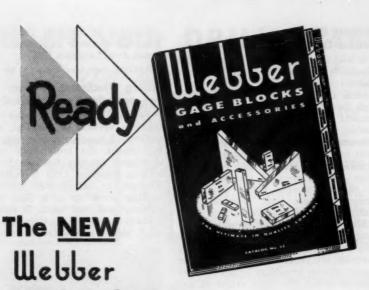
1½ to 75 ton Capacity

> Send for Catalog Showing Complete

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GREENERD ARBOR PRESS CO

Encircle No. 397 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK



Catalog for 1956

• For more than 25 years, precision manufacturers and toolmakers have relied upon Webber for

The 1956 Webber catalog presents the newest developments in gage blocks and related accessories, and, in our opinion, offers the most complete selection of such equipment available today . . .

. . . still further establishing Webber's position of leadership in the important field of Quality Control.

the finest, most economically priced gaging equipment.

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GAGE COMPANY

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LANGEST EXCLUSIVE MANUFACTURER OF PRECISION GAGE BLOCKS

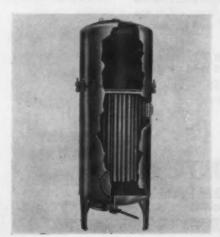
Pre-coat filter cleaned through backwash

A backwashing feature built into the Houdaille pre-coat filter eliminates manual cleaning. Unit mounts on a central coolant system tank. Provides high flow filtration for water based or mineral oil coolants used in drilling, honing, lapping, etc.

A circular steel plate divides filter body into two sections. Above is a clean coolant dome; below, 199 perforated filter tubes suspended vertically. Use of tubular screens rather than flat screens reduces tank diameter 30% without sacrificing filter surface area.

Screens are first coated with diatomaceous earth. In normal operation, only one pre-coat is needed daily. Solid particles are removed and held on the coated screens as coolant passes upward through tubes. To reach outlet at top of filter, coolant must pass through dome section.

Constant pressure keeps the dome filled with clean coolant. When contamination on tube surfaces becomes thick enough to impede passage of coolant, pump is stopped. This reverses flow, sending a backwash of clean coolant from dome down through tubes. Con-

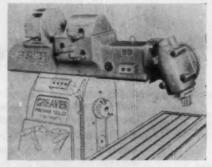


tamination is instantly flushed away. Houdaille-Hershey of Indiana, Inc., 26 South Ave., Lebanon, Ind.

Use ACTION Card, opposite page 64. Encircle No. 9

Milling attachment performs two operations simultaneously

Two milling operations, one horizontal, one vertical or angular, may be performed simultaneously with a new attachment, the toolmakers' overarm, developed for the Greaves horizontal milling machine. Unit is suitable for intricate or complicated milling and drilling work on dies, jigs, fixtures, patterns and tool work. It consists of a heavy duty overarm, universal milling head, motor and drive. It mounts on



the machine, replacing the standard overarm, and may be moved forward or back for positioning over the work.

Tools and arbors may be interchanged. There is a hand feed quill attachment with a No. 2 Morse taper for drilling work. The quill device provides 4" tool travel to the spindle.

A 2 hp drive motor provides 8 spindle speeds obtained through sliding clutches. The universal head, equipped with graduated swivel, may be positioned at any angle for universal and angular milling or drilling operations. The Greaves Machine Tool Div., Dept. HS, J. A. Fay & Egan Co., 2011 Eastern Ave., Cincinnati 2, O.

Use ACTION Card, opposite page 64. Entirele No. 10

Convert your DRILL PRESS

into an Automatic!

SINGLE OR

MULTIPLE SPINDLE

SET RAPID APPROACH

to any length up to 4" + stroke with rapid cycle dial. Saves time. Ideal for jig tumbling.

SET DRILLING SPEED

to material hardness with Feed Valve Dial. Adjusts to an infinite range of speeds. Increases drill and tap life.

ADJUST DRILLING DEPTH

to .002 plus or minus accuracy with micrometer type Depth Dial.

MANUAL LEVER CAN BE

USED ANYTIME for manual drilling or guiding in jig tumbling.

FOR DRILLING . TAPPING . REAMING . THREADING
COUNTER BORING . SPINNING . SPOT FACING . FLY CUTTING

AIR OPERATED AND HYDRAULICALLY CONTROLLED, the General Automatic Drill Feed is a precision instrument. Carries warrantee of parts. Has operated continuously for over 10 years without replacement of parts. Hand and foot pedal release provide dual safety factor. Write for complete facts and new reduced prices to General-Pacific Corporation, 8740 Washington Blvd., Culver City, California.

GENERAL AIR OPERATED-HYDRAULIC CONTROLLED
Multi-Speed DRILL FEED

SUPER FINISH OF UNIVERSAL DRILL BUSHINGS

reduces tool wear to a minimum



One sure way to cut excessive tool wear in your operations is to specify Universal Drill Bushings because their superfinish bores help reduce wear on production tools to an absolute minimum, especially in close tolerance work. The blended radius on the top inside diameter helps prevent tool hang-up and breakage. 100% concentricity and hardness tests insure accuracy, uniform high quality and long life. Knurled heads provide a quick, sure grip. Universal Drill Bushings are produced in a complete range of standard sizes and lengths. Orders for special dimensions will receive prompt attention. For complete information, write to the office nearest you-Universal Engineering Sales Co., 1060 Broad St., Newark 2, N. J.; 5035 Sixth Ave., Kenosha, Wis.or our home office.

UNIVERSAL **ENGINEERING COMPANY**

Frankenmuth 10, Michigan

171-B

KAUFMAN TAPPING MACHINES



Built For Specific Production Jobs

- Single or Multiple Operations Precision Depth Control
- Non-reversing Motor Drives
 Pressure Lubricated Lead Screws
- Fast, Accurate, Rugged Index
- Other Head Units Available

And Many Other Worthwhile Features

Send prints and samples of your work for further information and recommendations on how Kaufman Tapping Machines can reduce your production costs.

Catalogs Number 754 and 1153 Mailed on Request

KAUFMAN MFG. CO.

546 SOUTH 29TH STREET MANITOWOC, WISCONSIN

Encircle No. 400 on Card, Opposite Page 65 272

Encircle No. 401 on Card, Opposite Page 65 MACHINE and TOOL BLUE BOOK

Solenoid punch

A bench type solenoid punch which is capable of delivering a 3500 lb. blow in a 1/5 of a second cycle operates on



110 volt single phase power. It has a variety of applications, including: staking, riveting, cutting, crimping, marking and bending. High Speed Hammer Co., Dept. RH, Rochester 21, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 11

Twin-counter for automatic screw machines

A twin counter unit to record production of Brown & Sharpe Model 00 automatic screw machines has been announced by Count-A-Larm Co., Dept. R-B, 1271 W. North Ave., Chicago 22.

The unit incorporates two separate counters. A counter sealed within the housing serves to record total job production, and can only be re-set to zero when the housing is unlocked by

TROYKE

ROTO-INDEXER

Takes the place of expensive jigs and fixtures in connection with milling, drilling, jig boring, grinding and slotting.

Rapid - Positive - Accurate



CHUCK OR T-SLOTTED INDEXING TABLES - FOUR MODELS

Hand operated. Unique patented block out arrangement, Can be used in vertical or horizontal position.

ROTARY TABLES



STANDARD MODELS WORM WHEEL OPERATED ROTARY TABLES

Five sizes: 9", 12", 15", 21"
For die sinking, jig boring, cam milling.
Indispensable in wood and metal pattern
shops.



HEAVY DUTY MODELS WORM WHEEL OPERATED ROTARY TABLES

Three sizes: 18", 21", 25"
These larger, heavy duty models are used for jig work, plamer jobs, and on horizontal boring mills.
DIVIDING ATTACHMENTS or DRILLING ATTACHMENTS can be furnished.

See Your Dealer or Write for Catalogs



Encircle No. 402 on Card, Opposite Page 65



authorized personnel. A second counter can be used to record shift production or to help keep daily records.

Counter records only full-length parts. Short parts, occurring when bar stock in the machine is exhausted, are never counted. When bar stock has run out, a signal light is lighted and a warning buzzer is sounded.

Use ACTION Card, opposite page 64. Encircle No. 12

Hydraulic ram units

Jacy hydraulic ram units mount in a fixture or machine for press operations such as piercing, shaving, broaching, burnishing, staking, forming, dimpling, riveting or clinching. Each unit contains a ram to which various types of press tooling may be attached. The units can be grouped about an irregularly shaped part to perform a number of operations simultaneously. Typical applications are the piercing of attachment holes in automobile doors, fenders and similar parts.

Units are produced in two types, a side-mounted series that is available in a variety of strokes, and an end-mount-



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ONLY DEKA-BORE



• Can be adjusted in fractions of 1/10,000" on the full diameter as easily as reading 1/16" on a steel rule. Not a vernier or scroll adjustment.

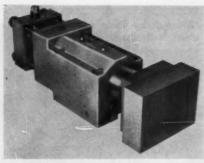
• Can be calibrated in increments of .00005 on radii or .0001 on diameter as easily as picking up .002 on a conventional micrometer dial.

Attach this ad to your letterhead and mail for a free demonstration or literature!

PRECISION TOOL & MFG. CO. OF ILL.

1305 S. Laramie Ave., Cicero 50, Illinois

MT-12



ed series that is available in a single short stroke. Both series are available in three capacities: 5000, 7000 and 10,000 pounds thrust per 1000 psi. Modern Engineering Service Co., Dept. JS, 1695 Twelve Mile Rd., Berkley, Mich.

Use ACTION Card, opposite page 64, Encircle No. 13

Rotary table

The new Palmgren No. 86 rotary table has an 8" diameter top with %"x 11%" T slots crossing at center. The



center is bored for a 1½" locating plug. Table is graduated 360° and rotary feed is positive through worm and gear with 40:1 ratio. The rotary indexing dial is calibrated in three minute intervals. Hand wheel and dial are removable and an indexing attachment and plates can be added to the rotary feed shaft.

Overall height of the table is only 34". Base diameter is 94". Chicago Tool and Engineering Co., 8383 South Chicago Ave., Dept. MMB, Chicago 17, Ill.

Use ACTION Card, opposite page 64, Encircle No. 14

INDEXING TURNTABLES



AMS



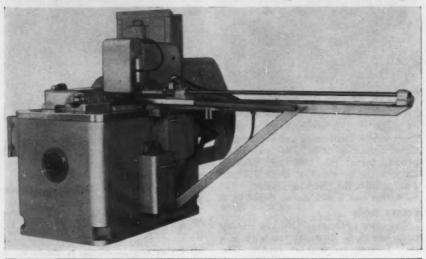
Eisler makes over 100 different types of indexing mechanisms for spraying, plass in-sulators, melting and glass glazing with retating stations and motorized or hand operated. Rotating tables of all kinds for over 35 years. We supply any part of complete equipment and we make special turnizables and cams to your specifications. You are invited to see our showroom and see for yourself our many models on display. Yrite or eall for our new stating No. 85-55.

CHARLES EISLER JR., PRESIDENT EISLER ENGINEERING CO., INC., 762 So. 13th Street, Newark, N. J.

Tube Cut-off Machine

The Grieder tube cut-off machine is claimed to be accurate within .003".

Utilizing the shear type cut, the machine is designed to cut off tubing of





pays for itself in a week



MAGNETIC HOLDER

For descriptive literature and address of sales agent in your area, write to

your area, write to
JAMES NEILL & CO. (U.S.A.) LTD.
37/39 PEARL STREET, NEW YORK 4.

Encircle No. 405 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

For Heat Treating Small Parts

Here's a series of compact, durable furnaces that are ideal for tool and die shops and small laboratories. Any desired temperature within the range of 300° to 1900° F, is controlled by

an accurate, built-in Huppert temperature controller. All-steel construction—multi-insulation—sturdy Kanthal elements—counter-weighted doors—removable porcelain tray.

Model No.	Inside Dimensions		Temp. Range	Watts	Price	
	Wide	High	Deep	Temp. Kange	110 Volts AC	
434DL	41/4"	35/8"	43/4"	300°-1600° F.	920	\$ 86.00
439DL	41/4"	35/4"	9"	300°-1600° F.	1650	115.00
436DL	45/0"	33/4"	6"	300°-1900° F.	1650	115.00
5DL	45/8"	33/4"	9"	300°-1900° F.	1750	176.00
9DL	6"	6"	6"	300°-1900° ₱.	2200	200.00
669DL	6"	6"	9"	300°-1900° F.	3000	248.00
10DL	8"	4"	6"	300°-1900° F.	2000	220.00
849DL	8"	4"	9"	300°-1900° F.	3000	265.00

Available for 220 Volt AC at small additional cost.
Stainless steel housing slightly higher.

 Write today for literature on complete line of Huppert furnaces and ovens in floor and bench models.

> Ask for Hints on Heat Treating.

-K. H. HUPPERT CO.

6845 COTTAGE GROVE AVENUE, CHICAGO 37, ILLINOIS

Manufacturers of Electric Furnaces and Ovens

Encircle No. 406 on Card, Opposite Page 65

all sizes and shapes from ¼" to 4" outside diameter. Model 2000 MAC will cut tubing ranging in diameter from ¼" to 2" with wall thicknesses up to .125. Model 4000 MAC will cut tubing from 2" to 4" with wall thicknesses up to .187. The former is capable of making up to 6000 cuts per hour depending upon length of cut. Rate of feed is 600 feet per minute.

Feed is accomplished by a number of opposed feed rolls that feed the tubing automatically through the machine to a positive stop located in alignment with the stock. The stock is held firmly in dies which act as a vise and are of the same diameter as the tubing to be cut.

Tubing remains stationary during the cutting action and the cut is accomplished by means of two blades actuated by the crankshaft of the machine. A small horizontal cut is made first, re-

moving only the top portion of the tube, leaving an opening into the bore of the stock. The horizontal blade then retracts and the vertical blade comes down into the opening made and completes the cut without distortion and with minimum burr, according to the manufacturer, Grieder Industries, Inc., Dept. JS, Bowling Green, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 15

New hammers added to line

Podlin Tool Co., Dept. B, 11849 Franklin Ave., Bensenville, Ill., has added 1½ and 5 pound lead hammers to its line of 3 pound hammers.

All three sizes of hammers are included in Podlin's exchange service, which enables the user to purchase an initial supply of lead hammers and then exchange them for new ones at half the original cost after they have been beat up through usage.

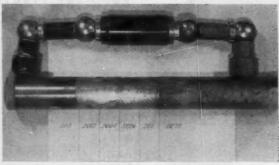
Use ACTION Card, opposite page 64. Encircle No. 16

Portable Magnetic Particle Inspection Kit

The Sempun magnetic flaw detector, a portable magnetic inspection tool, requires no electrical current source for operation. Unit is a permanent magnet with ball pivots and multiself-adjusting magnetic pins, which are claimed to permit good contact on any size or shape of part.

Kit contains check

test piece, re-magnetizing leads, and plastic spray bottles containing the inspection medium (iron oxide, powder or ink). Check test piece has surface flaws and sub-surface flaws of various depths. Since the permanent magnet supplies de type magnetic force, subsurface as well as surface flaws are in-



dicated. National distributor is Rice-Peterson Sales, Inc., Dept. KE, P.O. Box 1114, Palo Alto, Calif.

Use ACTION Card, opposite page 64. Encircle No. 17

Hand knurling tool

A hand knurling tool, the Knurlmaster, is claimed to save time on short





"VERTICAL TURRET LATHE APPLICATION"



Illustrated above is a Model 12M Fen Automatic Wrench operating a 36" chuck on a Plain Vertical Turret Lathe.

The Fen Automatic Wrench with a right angle drive has proven to increase production and reduce worker fatigue on the Plain, as well as the Single and Double Indexing Vertical Turret Lathes. The Fen Automatic Wrench with a right angle drive is available in torques up to 12,000 inch lbs.

For detailed information regarding the application of the Fen Automatic Wrench to your machines, phone, wire or write.

THE FEN

MACHINE COMPANY 28915 LAKELAND BLVD. WICKLIFFE, OHIO



production runs and individual parts. Furnished with three standard steel knurls, tool cuts a knurl on stock from \%" to 1" diameter.

The forged steel frame clamps over workpiece and automatically centers itself as workpiece rotates on lathe or drill press. By turning the handle, a screw and locknut feature enables it to cut a uniform pattern over the entire work surface. The flat faces of the tool are ground so that they can be rested on parallels when using the drill press for knurling. Rockwin Mfg. Co., Dept. MG, 45 Rose St., New York 38, N. Y.

Use ACTION Card, apposite page 64, Encircle No. 18

Shaft burnishing machine produces 5-8 micro finish

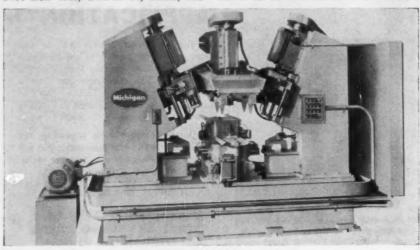
The No. 145 Vulcan air operated shaft burnishing machine produces a 5 to 8 micro finish on bearing surfaces.

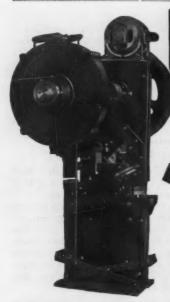
Lower rollers are electrically driven; top rollers are free running. An air operated toggle arrangement gives the correct pressure for a given micro finish. Minimum shaft length is 6", maximum length to suit. Can be a single or multiple unit. Vulcan Tool Co., Dept. BB, Dayton 10, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 19

Automatic Frame Driller

Michigan Drill Head Co., Dept. JS, P.O. Box 4643, Detroit 34, Mich., has released an Angle-Matic for drilling holes in automobile frames. Machine





Beloit

PUNCH,
BAR SHEAR, ANGLE SHEAR
and NOTCHER

Send for illustrated literature and prices today.

Beloit
Equipment
will cost
you less
and serve
you better.

Here's the ideal equipment for shearing, mitering, notching and coping angles. This model also shears flat and round bars. Punches to the center of 10" without changing the set-up. Versatile. You'll find many jobs for this Beloit machine..., and the savings will more than pay for it!!

Write for complete details.

HENDLEY &

WHITTEMORE CO.

100 Blackhawk Blvd.

Beloit, Wis.

Encircle No. 409 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

features an 8-spindle head. It drills 19 holes, at various angles, in each frame at the rate of 160 frames per hour.

Driller is completely automatic. Two 5-spindle drill heads and one singlehole driller are mounted on self-contained power units.

Use ACTION Card, opposite page 64. Encircle No. 20

Dwarf dust collector

The Craftool dwarf dust collector is capable of handling 230 cu. ft. of air per minute. The separation of dust takes place in two stages with heavy particles retained in an expansion chamber while fine dust is collected in a filter bag. Cast aluminum impeller enables maximum efficiency to be obtained from ½ hp ball-bearing jet motor.

An air outlet is furnished where the cleaned air discharge can be connected with the outside atmosphere. One or two machines can be connected with



the dust collector. Craftools, Inc., Dept. MG, 401 Broadway, New York 13, N.Y.
Use ACTION Card, opposite page 64. Encircle No. 21





MACHINE RACKS

ALSO FOR

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- . MACHINE KEYS

STANDARD MACHINE RACKS are Standard for extreme accuracy and finish . . . as Standard is a pioneer in the field with special equipment and skilled mechanics. Can furnish almost any size and pitch . helical rack, stud tooth, B & S or Fellows tooth. Tell us your RACK requirements . . We'll be happy to quote. Standard also makes the other high quality produsts listed above. Free catalog.

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Plants: Beaver Folis, Pa.; Hammond, Ind.

Encircle No. 411 on Card, Opposite Page 65



Drill unit line simplified

The Hause Holomatic drill unit is now available in two basic power units: Model 24 which utilizes electric motors for spindle rotation, and Model 14 which has quill mounted air motors. A selection of four standard drives and five standard spindles for the Model 24 and nineteen standard air motors for the Model 14 are offered. In addition, con-



trol and mounting accessories allow customers to select components that meet their individual requirements.

 Drill units use shop air line pressures for thrust and incorporate a self-contained hydraulic system for spindle travel control and feed regulation. The concentric design of the air thrust, hydraulic control, and stop systems are reported to assure linear spindle travel with no pull off at the end of each stroke. Isolation chambers vented to atmosphere are provided between the air and hydraulic sections to prevent air leakage into the hydraulic oil. Units can be set up to perform most drilling, reaming, tapping, threading, chamfering, spot facing, hollow milling, and other end cutting tool operations that are within capacity limits. Hause Engineering Co., Dept. JS, Montpelier, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 22

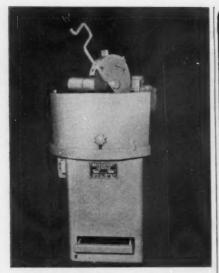
Left hand and center drills

Louis Levin & Son, Inc., Dept. KE, 3610 S. Broadway, Los Angeles, Calif., has announced the addition of left hand and center drills to its line. Spirec center drills are rigid and will produce

CE Station

THE GRANT MFG. & MACHINE CO.

Bridgeport 5, Conn.



true starting holes when drilling very small holes. This type is available up to 3.00 mm (.1181").

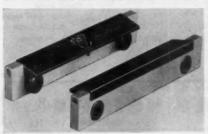
Use ACTION Card, opposite page 64, Encircle No. 23

Magnetic hold downs

Magnetic hold downs have been added to the Miti-Mite line of magnetic tools by the Lufkin Rule Co., Dept. JS, Saginaw, Mich.

Each hold down is swivel mounted in an aluminum plate containing two permanent magnets that attach instantly to the jaws of a vise. There is no need for blocking or shimming.

Use ACTION Card, opposite page 64. Encircle No. 24





for ease of operation

Table floats on precision balls

Mounts on mill in matter of minutes

MOUNTS ON ANY BRIDGEPORT MILLING MACHINE

Write fer trial effer plan and descriptive literature.

J. M. KALINS & COMPANY

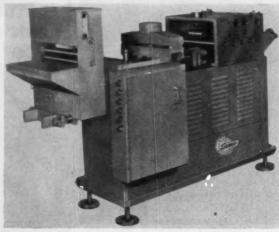
115 East Washington Ave., Bridgeport 8, Conn.

Self-contained Gripper Feed Can Be Moved from Press to Press

The Sesco hydraulic gripper feed unit is self-contained, can be moved from one press to another, can feed into the press from the right, left, front or back. It will feed stock of any width up to 20" or can be so designed to take up to 48". It feeds within 0.003" or less of the selected setting. Unit is timed by the stroke of the press ram.

A hydraulic tank assembly serves as the base and is a reservoir on which the other sub-

assemblies are mounted. The rear stock guide assembly is adjustable to handle



stock from a maximum width of 48" down to a minimum of ½" in width, A

Laboraving Production CHUCK

Will pay for itself in 60 to 90 days

operation.

On turrets, engine lathes, cutting-off machines, drill presses or any type of chucking machine, the Barker Two-Jaw or Three-Jaw hand operated chuck will increase production up to one third and actually pay for itself while doing it in from 60 to 90 days. Hand lever eliminates pneumatic and hydraulic systems, yet closes and locks jaws with lathe running or stopped. Over 30 years

Write for bulletin 201 today.

of labor saving, production boosting



closes and locks while lathe is running.

Jaws locked

THOMAS HOIST CO

Encircle No. 414 on Card, Opposite Page 65

hand knob is located at the end of the cylinder for adjusting the feed length.

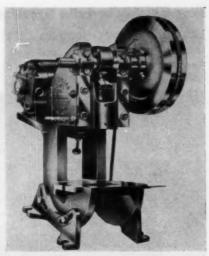
The gripper assembly is attached to the end of the piston rod, travelling on hardened and ground bars. A double-action hydraulic cylinder, sequenced with feed stroke, permits accurate feeding. Pinch grip pressure is up to 6000 lb. Sesco Inc., Dept. JS, 8881 Central Ave., Detroit, Mich.

Use ACTION Card, opposite page 64. Encircle No. 25

Two ton bench type punch press

Allen Model BT-2 two ton open back inclinable power bench type punch press, for small stampings, has a production capacity up to 250 operations per minute on continuous operation.

Straight ram guides with flat gib give accurate fitting of dies for precision stamping. Frame can be tilted to any operating angle. Large die space for stamping, shearing, forming, drawing, riveting, blanking, cutting. Stand-



ard stroke is ¾" with ¾" to 1½" strokes optional. Alva Allen Industries, Dept. RB, Clinton, Mo.

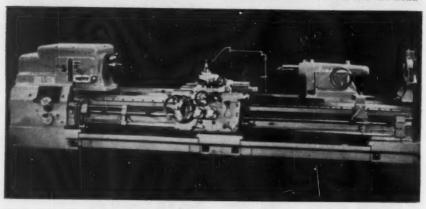
Use ACTION Card, opposite page 64. Encircle No. 26



New 32" Engine Lathe Provides for Extremely Heavy Hogging Cuts

The Axelson 32" engine lathe provides a full 75 hp for extremely heavy hogging cuts.

A 2-lever shift allows quick selection of spindle speeds. A standard stock footmounted motor is V-belted to the head-





FALLS PRODUCTS, INC., 122 Genoa Street, GENOA, ILL., U.S.A.

stock gearing without benefit of a clutch. Starting and stopping of heavy inertia loads is done by electric plugging. For horsepowers lower than 75, a clutch is provided. Spindle speeds are from 6 to 750. All the headstock gears are splash lubricated.

Power from headstock is fed directly through totally enclosed oil-bathed change gears down to the gear box which is totally enclosed and provides a selection of 81 feeds from 1005 to .35. Axelson Mfg. Co., Div. of U.S. Industries, Inc., P.O. Box 58335, Vernon Station, Los Angeles, Calif.

Use ACTION Card, opposite page 64. Encircle No. 27

Tool post holder for pneumatic grinders

The Mall tool post holder for pneumatic grinders, is claimed to give the precision needed for jobs using grinder on lathe.

Made of 9/16" cadmium rolled steel, it is for specific use with the Mall



models PG-K-1030B and PG-K-1030L midget pneumatic die grinders. This pair of midget pneumatic grinders operate at 30,000 rpm. Mall Tool Co., Dept. RB, 7725 South Chicago Ave., Chicago 19, Ill.

Use ACTION Card, opposite page 64. Encircle No. 28

Wardwell Saw Grinder, "35T"



Write for Bulletin 35T

Sharpens Metal Saws in Gangs . . . Saves Money

Sharpens up to 115 saws .015" thick at one time, better than new. Includes slitting and screw slotting saws, and milling cutters up to 5½" diameter. Completely automatic. All you do is

start the machine. It does the rest.

"35T" saves money for you by greatly increasing saw life. You owe it to yourself to investigate this remarkable machine.



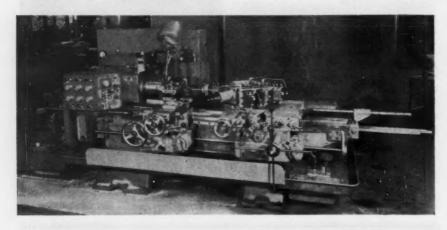
MANUFACTURING CO.

Maker of largest line of saw and tool sharpening machines

Universal Saddle Type Turret Lathe

The 32 speed headstock of the Jones & Lamson universal saddle type turret lathe has two ranges, each with 16 forward and reverse speeds powered by

a 40 hp single speed motor. Spindle speeds within each range can be changed at any time by a pre-selector switch with push button control. These





changes are accomplished through solenoid valves which engage or disengage hydraulically operated multiple disc clutches.

Automatic speed selection and change is provided for each face of the hexagon turret by means of a secondary panel having six pre-selector switches. Speeds so obtained can also be changed at any instant by a master pre-selector switch and push button. All conventional headstock controls are by switch or push button.

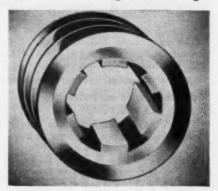
Basic spindle speeds available for the 2½" hole spindle are a low range of 30 to 527 rpm and a high range of 89 to 1542 rpm. Six additional range groups are available by accessible change gears, providing a total spread of 18 to 2550 rpm. The 4½" hole spindle has a basic low range of 20 to 341 rpm and a high range of 58 to 998 rpm. Additional change gears provide a total spread through six range groups of 10.5 to

1491 rpm. Jones & Lamson, Dept. DR, 522 Clinton St., Dept 710, Springfield, Vt.

Use ACTION Card, opposite page 64, Encircle Ne. 29

Through-broached socket screw

The Bristol socket set screw, with the socket extending the full length



INDUCTION HARDENED PRESS BRAKE DIES

for greater die life at no extra cost on any make of press brake

Whether it is a simple die for angle bending or the more complex dies for any of the combined bending and forming operations, CHICAGO induction-hardened dies offer bonus performance at no extra cost. Field reports on these dies show better than ten times the useful life of the conventional dies used in press brakes. Get the full particulars on CHICAGO dies for your next press brake job.





Encircle No. 419 on Card, Opposite Page 65

4915

Heavy lines

indicate

hardened surfaces

of the screw, is now available in a range of sizes from No. 4 wire size to 1" diameter in suitable lengths, and in either the hex or multiple spline socket.

The through-broached socket is symmetrical, and the screw can thus be wrenched from either end. This makes it useful in automatic assembly processes. No grinding or modifications are necessary for use in power screw-drivers. Screws can be used either as set screws or as locking rings. The Bristol Co., Socket Screw Div., Dept. MG, Waterbury 20, Conn.

Use ACTION Card, opposite page 64. Encircle No. 30

Mounting device uses strength of both hub and shaft

The Gripspring fastens hubs onto a shaft without the use of splines or keyways. No clearances are present in the assembly.

Device is wedged between hub and shaft under pressure made by hand



tools. The outer ring expands and the inner ring contracts. Full strength of both hub and shaft is utilized. Assembly consists of a straight cylindrical shaft and hub bore. U.S. Automatic Corp., Dept. RH, Amherst, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 31





NOW... PORTING TOOLS

Available from Stock

AND-10050 -

Send for valuable data sheet A complete line of carbide tipped combination ream, counterbore and facing tools to form AND-10050 standards. Tube sizes 2 through 24 in turret lathe and drill press types. Special tools made to order.

WETMORE TOOL & ENGINEERING CO.

Engineers Designers Manufacturers 5318 E. Washington Blvd., Los Angeles 22, Calif. AN 9-7266

Encircle No. 421 on Card, Opposite Page 65

ECONOMY



SPELLS SAVINGS

If your requirements call for DU-PLICATION of standard items, it will pay you to specify — "ECONOMY" ... Delivery is always dependably prompt because all items are continually in stock.

★ "TRU-LOC" Adjustable
Adapter Sleeves and Nuts —

★ A. S. A. DRILL JIG BUSHINGS ★ A. G. D. PLUG & RING GAGES

Get our prices on salvaging your wornout plug and ring gages.

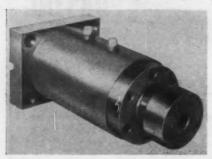
> Descriptive Bulletin & Price List Upon Request —

ECONOMY TOOL & MACHINE CO.
1929 S. 68th St. • Milwaukee 14, Wis.

Encircle No. 422 on Card, Opposite Page 65

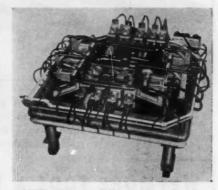
Hydraulic Ram Units

Jacy hydraulic ram units mount in a fixture or machine to perform press



operations on a part. Various types of press tooling may be attached to cylindrical ram.

Units are used wherever piercing, flanging, forming, dimpling, riveting or clinching operations are desired without requiring a conventional press. They can be mounted in groups to perform a number of operations simultaneously, and a single unit can be tooled to perform more than one operation.



HRU (long stroke) units are used where side-mounting is preferred, or where a longer stroke can be utilized



SPEED. up production in multiple op-ACCURACY. erations with push-out type **ECONOMY** HALL COLLET CHUCKS. Full spindle capacity or over. Tremendous grip over or under stock size to .007-without adjustments. All grip ... no slip. No bearings...no heat or lost power. Instant release without stopping lathe.

Made in Two Sizes to Fit Your Requirements:
Model A...1" (max. capacity 1-1/16")
Model B...2" (max. capacity 2-1/16")
Round, squere or hexegon collete, plain or serveted
No. 3 Collet Pads Now Available

SATISFACTION CUARANTEED!

Write today for illustrated catalog and price list - Dept. A-12

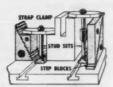
HALL MANUFACTURING COMPANY

Encircle No. 423 on Card, Opposite Page 65 292



Encircle No. 424 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK



SURE GRIP STEP BLOCKS

Clamping tools of all types
Write for free tracing templates

TIETZMANN TOOL CORP.

Dept. C. T.

Englewood, Ohio

Encircle No. 425 on Card, Opposite Page 65

to provide clearance for loading and unloading. HSS (short stroke) units are used where end mounting is preferred and only a short stroke and little clearance are needed, or they are mounted in special machines that incorporate a separate means of withdrawing the units to provide loading clearance. Both HRU and HSS series are available in three capacities: 5000, 7000, and 10,000 pounds thrust per 1000 psi of hydraulic pressure. Modern Engineering Service Co., Dept. JS, 1695 Twelve Mile Rd., Berkley, Michigan.

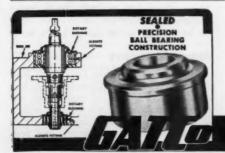
Use ACTION Card, opposite page 64. Encircle No. 32

Mechanics' loupe

A magnifying loupe which may be used in connection with height gages, micrometers, verniers, slide-rules, checking fixtures and other types of instruments has been announced by Englass Co., Inc., Dept. RH, Rochester 16, N.Y. For prevention of eye strain,



loupe has a 5X power lens.
Use ACTION Card, opposite page 64. Ensirele No. 33



ROTARY BUSHINGS FOR DRILLING, CORE DRILLING ROUGH AND FINISHED BORING

The inner race of the GATCO bushing rotates with the tool, piloting and tool accurately below or above the work—or both.

Eliminates expensive tool construction—Reduces tool wear—Prevents seizure and pilot breakage—Especially adapted where precision is required.

Write for full information and prices

ROTARY BUSHINGS

42326 ANN ARBOR ROAD, U.S. 12, PLYMOUTH, MICH.

Encircle No. 426 on Card, Opposite Page 65

HYBCO TAP GRINDER

Sharpens Chamfers, Flutes and Spiral Points



MODEL 1100

 Capacities No. 0 Machine Screw to 1½" Hand Taps.

HENRY P. BOGGIS & CO.

Encircle No. 427 on Card, Opposite Page 65

Rivet Spinning on the LINLEY

is fast, low in cost and noiseless

Save time and mency by putting your riveting on the LINLEY RIVETER. Send us samples of your work and we'll gladly and without obligation give you estimates on the time and cost of handling your work the LINLEY WAY.

Available in sizes and types for iron and cold relied steel rivets up to %"; larger rivets of softer materials can also be handled.

Send for Bulletin R Today

LINLEY BROTHERS CO. 673 State St. Ext. Bridgeport I, Conn.

Bench comparator for mechanical indicator or air-probe use

The STD-5 bench comparator is adapted for measurements utilizing the mechanical indicator or air-probe type of air equipment. The built-in system of super fine adjustment has .040 range.

Column can be mounted under the platen, and using the hole provided in the platen, the interlock of either the indicator or air-probe can be mounted to accommodate diversified



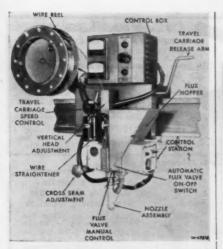
measurement requirements.

The platen is equipped with tipped holes for mounting special fixtures and locating devices. Acra-ment Gage Div., Myer Corp., Dept. BB, Park Ave., Cranston, R.I.

Use ACTION Card, opposite page 64. Encircle No. 34

Automatic welders

The Lincoln Electric Co., Dept. RH, 22801 St. Clair Ave., Cleveland, O., has created a new line of equipment for hidden or submerged arc welding, which includes three welding heads, controls and adjustments, accessories, and two power sources. The line has been de-



veloped to give flexibility to Lincolnweld automatic equipment in meeting requirements of any type of job.

There is a choice of heads for either ac or dc current, field or shop welding, and constant potential or variable voltage power source. Operation controls permit a choice of instantaneous starting, either hot for intermittent welding or cold for precision starting; a choice of variable inching speeds, either slow or fast, away from or to the work; a choice of carriage operation to give stand-still starts, flying starts or manual control.

The heads are designed to permit easy adaptation to fixtures, either as a complete unit or as separate components. They can be universally positioned in any angle in three dimensions or off center for round-about welding, and can be positioned on seam while welding. Fine vertical adjustment up or down is made by a simple hand screw and can be made while welding. Either welding jaws or a welding nozzle for more precise placing of flux can be used.

Use ACTION Card, opposite page 64. Encircle No. 35

MICRO-HEIGHT GAUGE



NO OTHER GAUGE COMPARES FOR FAST, ACCURATE LAYOUT AND MEASURING

Capacities to 6" when used with this GREIST 3" Riser

The Micro-Height Gauge is a precision instrument, finished in satin chrome, which reads like a micrometer and measures from zero at base to 3" in thousandths. Use as a scriber for fast layout, or insert dial indicator for quick, accurate inspection.

THE GREIST MANUFACTURING CO.

4712 Blake St., New Haven 15, Conn. Encircle No. 429 on Card, Opposite Page 65

KLOPP SH

Production-proved in 125 top plants

You can't buy a better shaper



at twice the price

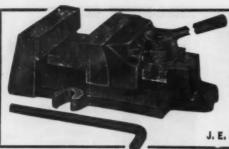
Model 600 with 24" stroke. Only \$3,815

MODEL	STROKE	PRICE
No. 300	11-3/4"	\$1,540
350	13-3/4"	2,000
425	16-3/4"	2,390
525	20-1/2"	
600	24"	3,815
Hydraulic 33-1/2".\$	Models: 20 7.015: 39-1	6", \$5,395; /2",\$7,820.

Ask us about Klopp users near you KURT ORBAN COMPANY, Inc.

42 Exchange Place, Jersey City, N.J.

Encircle No. 430 on Card, Opposite Page 65



Plunket Quick Action Vise for DRILL PRESS or MILLING MACHINE

Designed for production work, using an eccentric motion to apply pressure to jaws. Eccentric motion moves jaws 5/16".

Size No. 7 Net Price
6" Jaws 11/4" deep popular 11/4" Size No. 7

Size No. 7

Net Price
6" Jaws, 1½" deep, opens 4"\$91.48
Pressure between jaws, with handle
furnished, 2200 lbs, Net weight 36 lbs.
Our complete line includes Vises for Drill
Presses, Milling Machines, Shapers, Grinders

WRITE FOR CATALOG

J. E. Plunket Machine Co. 3230-32 Archer Ave.

Encircle No. 431 on Card, Opposite Page 65





Tamms Industries, Inc. 228 N. LoSalle St. Chicago 1, Ill.

Encircle No. 432 on Card, Opposite Page 65



Multiple Spindle Magazine Feed Power Screw Driving Machines

Latest type equipment for driving screws faster in products requiring two or more screws. These machines operate easily and require very little attention or adjustment once they are put in production.



Model C Automatic Part Feeders provide an efficient means of feeding parts to Automatic Machinery. They are fast feeding, have large storage capacity and are easy to load.

Pat. applied for.



COOK & CHICK CO 2415 WEST 24th ST. CHICAGO 8, ILLINOIS

Encircle No. 433 on Card, Opposite Page 65



Multifor BENDER CUTTER

CUTS, BENDS, PUNCHES

Available in hand or air operated models, the MULTIFORM is shipped complets with full assortment of dies and mandrels to puesh, bend and cut reund or flat brass, breaze, aluminum, steel, etc., up to \$\frac{1}{2}\times 11/2\times 22 \times 1

J. A. RICHARDS CO. KALAMAZOO, MICH.

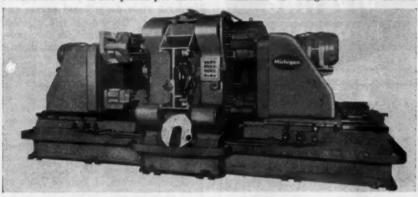
Encircle No. 434 on Card, Opposite Page 65

Double End Trunnion Machine

A special double-end trunnion machine for processing transmission adaptor plates drills, chamfers, and taps all mounting holes, and rough bores, finish bores and chamfers the starter hole. Production rate is 120 plates per hour.

Power cylinders automatically clamp the parts by hydraulic pressure, which is fed through the center shaft of the trunnion by means of a specially designed rotary bushing.

Machine is designed for a central

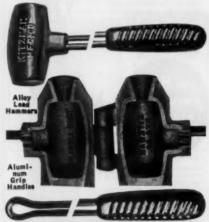




For Tool, Die, Pattern or Template layout on metal . . . Quick identification of bar stock, sheets, strips or parts . . . Shows up in sharp relief-dries instantly . . . Write for sample and circular on company letterhead.

MICHIGAN CHROME & CHEMICAL COMPANY 8615 Grinnell Ave. . Detroit 13, Mich

Encircle No. 435 on Card, Opposite Page 65 December, 1955



Hinged Hammer Moulds

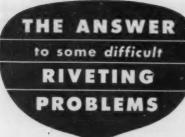
1, 2½ and 5 lb. sizes—order your alloy lead hammer requirements from your machine tool supply house

r direct from:

KITZMAN MFG. CO. Detroit 27, Mich. 15061 Hartwell Ave.

Encircle No. 436 on Card, Opposite Page 65

297





HILL MACHINE COMPANY

1301 EDDY AVE., ROCKFORD, ILLINOIS
Encircle No. 437 on Card, Opposite Page 65
298

coolant system, with all chips dropping through the center of the machine to a conveyor. Michigan Drill Head Co., Dept. JS, P.O. Box 4643, Detroit 34, Mich.

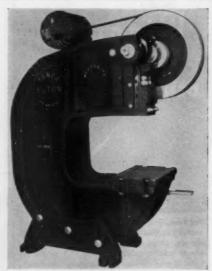
Use ACTION Card, opposite page 64. Encircle No. 36

Rigid rib style deep-throat press

A 7½-ton, 12¾" deep-throat press is claimed to be designed for fast, precision stamping with minimum downtime.

Solid one-piece, alloy steel crankshaft is heat treated and precision ground; crank style with 1½" standard stroke. Strokes up to 3" are optional at additional cost. The flywheel is carried on double roller bearings.

Ram hole is 1-9/16'' in diameter and 2%'' deep. The ram area front to back and left to right is $11\%'' \times 16\%''$. Distance from center of ram to back of press is 12%''. The bolster plate is 7%''



x11" x1". Kenco Mfg. Co., Dept. KE, 5211 Telegraph Rd., Los Angeles 22, Calif.

Use ACTION Card, eppesite page 64. Encircle No. 37

MACHINE and TOOL BLUE BOOK



THESE HOLES

BY A QUICK, EASY, INEXPENSIVE METHOD Your business letterhead will bring literature

WATTS BROS. TOOL WORKS Wilmerding, Pa.

Encircle No. 438 on Card, Opposite Page 65



The simplified PYRO Optical is the ideal instru-ment for direct temperature readings of ANY heated ebject in your plant. Completely SELF-CONTAINED. PORTABLE. RUGGED. LIGHT WEIGHT (3½ bs.) and FOOLPROOF. No cor-rection charts, no accessories and ne maintenance expenses. Unique design permits temperature de-termination even on MINUTE SPOTS. Fast MOV-ING OBJECTS and of the SMALLEST STRAMS. Write for Catalog No. 85 THE PYROMETER INSTRUMENT CO. New Plant and Laboratory, Bergenfield 3, N. J.

Encircle No. 439 on Card, Opposite Page 65

Portable Sandblast Gun



LINDBERG PRODUCTS CO., Los Gatos, Calif. Encircle No. 440 on Card, Opposite Page 65

SAVE 90% CHECKING TIME

When Building Dies

This new method of checking tapers on dies does away with die squares and height pauges.

Write for complete details.

Tietzmann Tool Corp. D.C. 1 Englewood, Ohio



MAKE HARDNESS TESTS With The KING PORTABLE

BRINELL Puts a load of 3000 kg. on a 10 mm ball. Can be used in any position — even upside down. Removable test head down, Removable test head for testing very large parts. Guaranteed to make accurate Brinell tests. Throats 4", gap 10", wt. 26 lb.

KING TESTER CORP.

442 N. 13th Phila. 23, Pa.



Encircle No. 442 on Card, Opposite Page 65

To Your Specifications except Screw Machine Cams

Design Assistance Offered

KIDDE PRECISION TOOL CORP. ROSELAND, N.J. 25 LOCUST AVE.

Encircle No. 443 on Card, Opposite Page 65



Super Sensitive Hand Tapper

With exclusive fea-tures sets new standards for as-curacy, time and taps saved. Capas-ity No. 0 to %". Write for name of steeking dealer in your area for demenstration.

Lassy Tool Co.

Encircle No. 444 on Card, Opposite Page 65



They're a MUST in every shop where many blows have to be struck without marring surfaces. Available with "SHUR-GRIP" drap

Write for circular and prices

LAWRENCE H. COOK, INC. AT MASSASOIT AVENUE, EAST PROVIDENCE 14, E. L.

Encircle No. 445 on Card, Opposite Page 65

Encircle No. 441 on Card, Opposite Page 65 December, 1955

Prove to yourself carbide-tipped Cross Live Centers maintain precision output longer, on tough continuous run workafford 2 to 3 times greater load capacity and outlive, as well as outperform, others. Test onel Available in Nos. 1, 2, 3, 4 and 5 Morse Taper, or straight shanks, other shanks to order. No. 2 M.T., \$39.00. Money back if center does not prove its worth in 24 day trial. Request free folder. Write direct, If distributor cannot supply you.

MORE OF EVERYTHING BUT WEAR . . . with Carbide Tipped CROSS* Live Centers



HERBERT CROSS & SON, Bala-Cynwyd 2, Pa. Est. 1910 *Makers of famous WEE Live Center.

Encircle No. 446 on Card, Opposite Page 65

Dust collector

Filtration through six "throw-away" filters is a feature of the after-filtering



THREE-FOURTHS OFFSET

mechanism of the Torit model 219 FM-A cyclone-type dust collector by Torit Manufacturing Co., Dept. RB, 287 Walnut St., St. Paul, Minn.

Used to collect dust, lint, chips, powders and fumes in industrial plants, the collector recirculates filtered air back into the room, thus preventing heat loss during cold weather. Its 5 hp, 3450 rpm motor pulls 2100 cu. ft. of air per minute through the 8" inlet at a static pressure of 3.0" (water) and an air speed of more than a mile a minute.

Thick pads of glass insulation wool on each of two open surfaces on the after-filter frame remove any dust that has not already been trapped in the collector's 41/2 cu. ft. capacity internal reservoir.

Use ACTION Card, opposite page 64. Encircle No. 38

Cushioned air motor

A 21/2" bore air motor with adjustable cushioning at either or both ends fea-



CHICAGO 19, ILL. Encircle No. 447 on Card, Opposite Page 65

1110 E. 87TH ST.

SEMI-OFFSET

SET UP COMPOUND ANGLES INSTANTLY!

Now save valuable time on intricate, angular set-ups with the fully universal MASTER MULTI-SWIVEL VISE. Three swivels instantly set any compound angle. Used worldwide. Interchangeable platens optional.

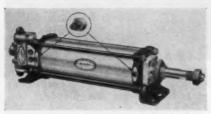
Write for circular.

DONOVAN MFG. CO.

80 Batterymarch St. Boston 10, Mass.



Encircle No. 448 on Card, Opposite Page 65



tures a built-in 4-way valve and speed controls. These valves are available for 8-volt or 110-volt momentary contact electrical control; 110, 220, 440, or 12-volt maintained contact control; direct mechanical or manual control; air-pilot valve control.

Operating at air pressures as high as 175 psi, the motor develops a thrust equal to five times the air pressure applied. Cushioning is adjustable by a metering screw located in each cushioned head. Metering screws are equipped with locknuts to prevent changes of settings during operation. Cushioning is effective on the final ¾" of the stroke. The Bellows Co., Dept. RH, Akron. O.

Use ACTION Card, opposite page 64. Encircle No. 39

Cut-off machine affords automation to any degree

Automation is available to any degree with the Model 48-W Bridgeport abrasive cut off machine. Air cylinder and hydro-check actuates head. Vise operates by air cylinder. Feeding mechanism, which grips material to be cut, moves it into position. Above operations form a cycle which repeats automatically.

Stainless steel spindle has grease sealed bearings. Vise holds both ends of piece being cut. Lobdell Div., United Engineering and Foundry Co., Dept. RS, Wilmington 99, Del.

Use ACTION Card, opposite page 64. Encircle No. 40

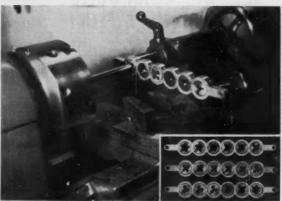


Multiple Threading Die Holder

A threading die holder with six adjustable dies has been announced by Mohr Tool & Mfg. Co., Dept. RB, Box 63, Maywood, Ill. To cut a thread, operator selects the holder with the die size, then rests the back of holder against tailstock of lathe, thus guiding die onto workpiece. A full thread can be cut with one pass, as the face of the die and back of holder are parallel.

A set of three "6 in

1" holders with 18 adjustable dies will cut no and nf threads \mathbb{h}" to \mathbb{h}" plus \mathbb{h}" and \mathbb{h}" pipe threads. Each die is set in multiple holder ready for use.



Adjustment when necessary for fit or material is made by three socket screws without removing the die from the holder.

Use ACTION Card, opposite page 64. Encircle No. 41



COLUMBUS DIE-TOOL

todayl

P. O. BOX 750 . COLUMBUS, OHIO

Encircle No. 450 on Card, Opposite Page 65 302



Encircle No. 451 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

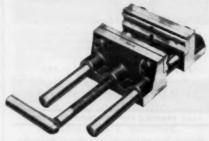


The Opti-Li-Magnifier increases the size of a defect or object four or seven times, and throws a beam of light on same. This pocket-size magnifier is distributed by Earl Elwyn Smith Assoc., Dept. DR, 7 S. Main St., West Hartford 7, Conn.

Use ACTION Card, opposite page 64. Encircle No. 42

Drill vise holds

The Crossley Shur-Grip drill vise securely holds rectangular and round parts for drilling, reaming and tapping. Vise has built-in parallels for locating





Encircle No. 452 on Card, Opposite Page 65 December, 1955

PORTABLE ELEVATING TABLE



Saves TIME and ABOR

Eliminate heavy lifting and cut handling costs. Slight foot pressure varies height from 31° to 46½°, leaving operator's hands free. Table swivels and locks in any position.

Our major services — Designing and Building — Dies, jigs, fixtures and special machinery.

SEND TODAY FOR ILLUSTRATED CATALOG No. 2

THE MIDWEST TOOL & ENG. CO.

Encircle No. 453 on Card, Opposite Page 65

303

20 TO 200 D.P.

SEND YOUR PRINTS FOR QUOTATION



WORM AND WORM GEARS HELICALS . LEAD SCREWS . BATCHETS STRAIGHT BEVELS CLUSTER GEARS . RACKS . INTERNALS . ODD SHAPES



Encircle No. 454 on Card, Opposite Page 65



*(U.S. & Foreign Patents)

Write for illustrated folder and details to

H. G. STENGER Precision Instruments

70-11 34th Avenue Jackson Heights 72, New York, N. Y

Encircle No. 455 on Card, Opposite Page 65

flat or rectangular parts. Handle swivels on screw, cannot get misplaced. Jaws contain horizontal and vertical V grooves for holding rounds up to 2" in diameter.

Vise jaws are of hardened steel and are 5" wide with a screw opening spread of 5". Crossley Machine and Tool Co., Inc., Dept. JP, 946 York Ave., Pawtucket, R.I.

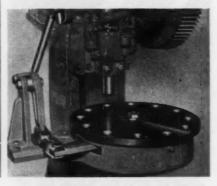
Use ACTION Card, opposite page 64. Encircle No. 43

Dial index feed automates machine operations

An automatic dial index feed which may be used on punch presses and drill presses converts a standard machine to almost full automation and operates at rates up to 6000 strokes per hour. Four bolts secure the complete unit to the machine installation.

The rotating table is actuated with each stroke of the punch press ram or quill travel of a drill press. Stations are loaded with the workpiece and automatically positioned under the punch or drill for the machining operation. The table can be hand loaded or hopper fed, depending upon the nature of the work and requirements. Typical punch press operations include automatic marking, assembling, reaming, trimming, crimping, etc.

Two models are available: 12" or 15" table diameter with choice of 10 or 12



stations. Up to 24 stations can be supplied as well as larger tables upon special request. Other specifications: over-all height 3¼", over-all depth front to back 13", over-all width left to right 21", net weight 95 lb. Benchmaster Mfg. Co., Dept. KE, 1835 W. Rosecrans Ave., Gardena, Calif.

Use ACTION Card, opposite page 64. Encircle No. 44

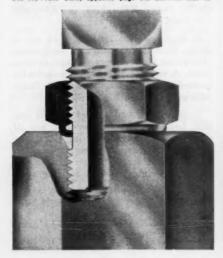
Fittings have straight threads for positive fluid seal

The CN line of hydraulic fittings, with straight threads that are claimed to assure positive fluid seal, has been announced by the L & L Mfg. Co., Dept. JS, Van Dyke, Mich. This new design locks fitting in place and at the same time seals port from fluid leakage. Fitting does not overstress or damage port.

The unit fits two types of straight thread ports: L & L, AND-10050. The L & L port can be sealed with or without 0 ring.

The CN is made in all fitting shapes—straight, 45° elbows, 90° elbows, tees, etc.—with a range from 1/8" to 2" od tubing sizes.

Use ACTION Card, opposite page 64. Encircle No. 45





CARTER PRODUCTS CO. INC.

423 Wm. Alden Smith Bldg. 30 Ionia Avenue, S.W.

GRAND RAPIDS 2, MICHIGAN

Encircle No. 456 on Card, Opposite Page 65

SCHAEFER

Standard Built-Up Snap Gage Blanks

Save up to 40% on built-up snap gages



Tool steel ends hardness R c 65 Gaging Surfaces Ground Finish Handles Sand Blast Finish

Medel		A	E	3 (D	1 1	E	F
25-25-0	6	.063	2.	50 2.5	0 .25	0 1	16	%
36 add	itiona	1 8	izes	avail	betwee	n the	ese I	imits
62	40	150	1.50	4.000	.625	.625	1.0	11/2

Also mfr. of standard flush pin blocks and standard reversible width gages.

Write for full literature,

39 Hale Street Ext.

SCHAEFER GAGES

Rockville, Conn.

Encircle No. 457 on Card, Opposite Page 65



ABART GEAR & MACHINE CO.

4829 West 16th Street • Chicago 50, Illinois Encircle No. 458 on Card, Opposite Page 65



VERTICAL

At last, a top quality industrial sander that provides all the most wanted features - yet sells for so little. \$9.95 complete with cord, plug, switch ready to use

Illustrated Literature on Request
A few desirable distributor
territories still available.

WALLS SALES CORPORATION
333 Nassau Avenue Brooklyn 22, N. Y.

Encircle No. 459 on Card, Opposite Page 65 306

New 20" disc grinders and sanders

The Model 20 Apex 20" disc grinder and sander has been announced by



Rankin Bros. Engineering & Sales Corp., Dept. KE, 11104 S. Alameda, Lynwood, Calif.

A single motion adjusts table up or down. New counterbalanced mechanism eliminates slow rack and gear adjustment. A reverse switch is conveniently located to speed right and left hand jobs and increase life of disc.

Wrap-over guard cannot flip off and tilts back to handle work at top of disc. Guard design plus impeller type disc throws dust into bag. Table can be tilted from any 45° angle up or down, and locked into position. It is squared automatically.

Use ACTION Card, opposite page 64. Encircle No. 46

Welded stainless steel tubing

A welding process to manufacture

MACHINE and TOOL BLUE BOOK

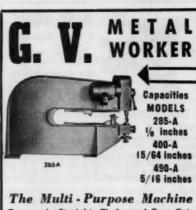


welded stainless steel and high alloy tubing and pipe is claimed to give the tubing better physical properties, appearance and corrosion resistance.

Rolls of the continuous mill are inverted and the formed tubing is welded from the underside, thereby permitting gravity to eliminate the weld bead on the id of the tubing. The tube has a smooth and flawless interior surface. and is reported to have better fabrication properties in the production of tube assemblies, heat exchangers, condensers and boilers. The smooth inside offers a better surface for the rolling in of tubes in tube sheets. Many high alloys or super alloys can now be rolled into tube sheets, while previously they had to be welded in.

Corrosion resistance has been improved because the absence of valleys or grooves leaves no place for solids to deposit or corrodants to become entrapped. The development of the new process in welding has made possible the production of alloys that have never before been furnished in welded tubing, wider size range, the production of finished quality Hastelloy pipe and tubing, and the cold drawing of these alloys in extremely light walls. Trent Tube Co., Dept. RH, East Troy, Wis., a subsidiary of Crucible Steel Co. of America.

Use ACTION Card, opposite page 64. Encircle No. 47 December, 1955



For use in Straight, Circle, and Free Cutting. Beading, Offsetting, Forming, Nibbling, Slotting, Louvering, Stretching, Shrinking, Etc.

TECH-PACIFIC 2811 LAFAYETTE

Far information write:

NEWPORT BEACH, CALIFORNIA

Encircle No. 460 on Card, Opposite Page 65



32-14 Northern Blvd., Long Island City 1, N. Y. Encircle No. 461 on Card, Opposite Page 65

Integrity Since 1919



HAND KNOBS

6 Sizes Cast-Iron

Tapped, Reamed or Blank

Hex-shaped hub for extra tightening

Write for catalog

TIETZMANN TOOL CORPORATION

DEPT. H-K

ENGLEWOOD, OHIO

Encircle No. 462 on Card, Opposite Page 65

Fully equipped modern machine shop with extensive Jig Boring, Surface Horizontal Boring and Thread Grinding facilities as well as modern Cam Milling and Cam Grinding equipment.

Your Inquiries Answered Promptly

23-22 44th Road

HIMOFF MACHINE CO., INC. Long Island City 1. N. Y

Encircle No. 463 on Card, Opposite Page 65

BORING

Large Precision Machining Done to your specifications

WE HAVE 13 JIG BORERS

KIDDE PRECISION TOOL CORP 25 LOCUST AVE. ROSELAND, N.J.

Encircle No. 464 on Card, Opposite Page 65



Encircle No. 465 on Card, Opposite Page 65 308



GEARS

in Stock—Immediate Delivery

Gears, speed reducers, sprock-ets, thrust bearings, flexible couplings, pulleys, ets. A complete line is sarried in our Chicage stock. Can also quote on special gears of any kind. Send in your blueprints and inquiries.

Send for Complete Catalog No. 18 CHICAGO GEAR WORKS
440-50 N. Oakley Blvd., Chicago 12, III.

Encircle No. 466 on Card, Opposite Page 65

"This Seems Worth Looking Into" GEM VISES
"Standard of Efficiency"

MACHINE VISES



Complete range of sizes for all Machines, Plain, Swivel & Tilting. Write for complote information.

J. E. Martin Machine Co. 548 W. State Springfield, Ohio

Encircle No. 467 on Card, Opposite Page 65

DRILL BUSHINGS

Hole Sixes—No. 80 to 3/32" O.D. 3/32" to 13/64" Lengths 1/4" to 3/4"
.0002 Tolerance on I.D., O.D., and Concentricity WRITE FOR CATALOG

PREBCO BUSHING CO.

14702 East Arrow Highway Baldwin Park, California

Encircle No. 468 on Card, Opposite Page 65

READING BENCH KEYSEATER

Portable — move directly to job; a time saver for both small and large shops.
3%" stroke;

adaptable for other work. Low first cost, prompt delivery.

Reading Machine Co. Cincinnati 37, Ohio

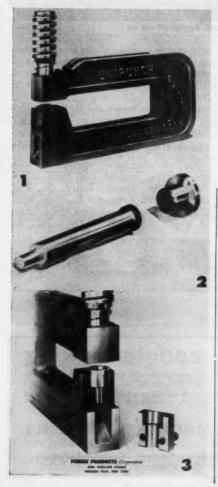


Encircle No. 469 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

Unitized perforating units

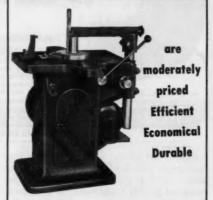
Series A Unipunch perforating units, shown in figure 1, have a maximum capacity of ¼" mild steel and are available in stock holder widths from 1" to 2½", giving a perforating range from .093" to 1.500".

Ingenious features of units are the two-piece punch and the small button die, enabling reduction in the cost of



Dacember, 1955

"DAVIS" KEYSEATERS



Built in 3 sizes for cutting keyways 1/16" to 1" width. Circular upon request.

DAVIS KEYSEATER CO.

4071/2 Exchange St.

Rochester 8, N. Y.

Encircle No. 470 on Card, Opposite Page 65

SLASH COST, TIME FOR ANY MACHINING JOB



We'll Prove It With A Free Demonstration

Now . . . a low-cost universal work holding fixture for use on lathes and most other machine tools! Attachments shown below hold any round

or irregularly shaped part, position it fast and accurately for any operation. Users report big savings! Accurate to .001".

Write for free demonstration or Bulletin No. 115



Encircle No. 471 on Card, Opposite Page 65



HEIMANN MFG.. CO. URBANA

Encircle No. 472 on Card, Opposite Page 65

replacement parts. Figure 2 shows the two-piece punch where the punch head slides off the punch body so only the toolsteel punch body need be replaced. Figure 3 shows the small button die which is held firmly in the die pedestal of the holder and which can be replaced without removing the holder from the

The punch-guide is free-floating in the upper arm of the holder which serves only to maintain the punch and die in concentric alignment. Stripping pressure is developed by the heavy spring interposed between the punchhead and the top of the punch-guide. The bottom of the punch-guide transfers this stripping pressure directly to the workpiece. No stripping pressure is exerted on the upper arm of the holder.

A mounting pilot pin is concentric with the center-line of the punch and die. This pilot pin is a constant %" in diameter regardless of the size of punch or die or whether the punch be round or shaped. Punch Products Corp., Dept. RH. 3800 Highland Ave., Niagara Falls, N.Y.

Use ACTION Card, opposite page 64, Encircle No. 48

Bench micrometer has non-rotating spindle

An indicating bench micrometer with non-rotating spindle has been introduced by the George Scherr Co., Inc., Dept. MG, 200 Lafayette St., New York 12, N.Y. For maintaining close limits on small work, it provides an aid for





countersinking tor

Two KENT machines are available—the smaller for nuts up to 3/4" hexagon—the larger for nuts up to 1-7/16" hexagon.

Hopper fed. Duplicate work spindles countersink both sides of nuts simultaneously giving fast, economical production. Write for bulletin.

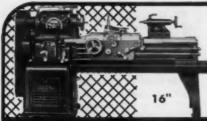
The KENT MACHINE COMPANY Cuyahoga Falls, O.

Drillers - Threaders - Slotters - Countersinkers Bar Pointers

Encircle No. 473 on Card, Opposite Page 65

310

MACHINE and TOOL BLUE BOOK



CARROLL AND JAMIESON LATHES

 This 16" lathe is equipped with 12 speed geared head, motor drive, and Timken mounted spindle. It's modern in design — with liberal dimensions.

Write today for descriptive bulletin.

THE CARROLL & JAMIESON MACHINE TOOL CO. . #45/ VIA

Encircle No. 474 on Card, Opposite Page 65

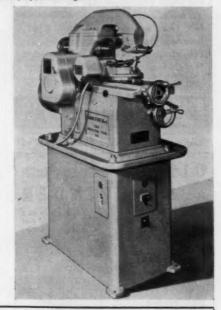
fine small-parts-measurements such as instruments, parts, wires, etc. Spindle and anvil have bores for holding different shapes of measuring spindles. It measures by .0001" directly from the micrometer thimble, which is 1%" in diameter. Its indicating head is graduated in .00005" with plus and minus .002" range, resulting in a total range of .004".

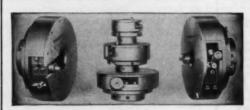
As a comparator it may be set without additional standards. A cable release retracts anvil instantly for repeat measurements.

Use ACTION Card, opposite page 64. Encircle No. 49
Alternate design for hobbing machine

An alternate design for the Hamilton No. 1 small gear, precision hobbing machine adapts the hobber to the use of existing tooling regardless of style or make of hobbing machine for which the tooling was constructed. The Hamilton Tool Co., Dept. HS, Ninth and Hanover Sts., Hamilton 4, O.

Use ACTION Card, opposite page 64. Encircle No. 50





MUMMERT-DIXON FACING HEADS

with Automatic Feed

One-way Tool Feed—6, 9 and 10" sizes.

Two-way Tool Feed—9, 12, 16, 20, 24, 30, 36, 40 and 46" sizes
Save many costly set-ups

Bulletin No. 4141 Gives Full Details

MUMMERT-DIXON CO., 122 Philadelphia St., Hanover, Pa.



For small production runs on 1/8" to 1" stock. Exclusive screw design gives perfect knurl pattern. Furnished with 3 hardened knurls of standard 1/2" dia. Forged steel frame is self-centering. Write for illustrated folder.

Dealer Inquiries Invited

ROCKWIN MANUFACTURING CO. 43-45 Rese St. New York 38, N. Y.

Encircle No. 476 on Card, Opposite Page 65

OLIVER DOUBLE DISK 30-inch GRINDER

Also made as a Disk and Spindle Grinder

for fast and accurate grinding of aluminum, non-ferrous metals and plastics



Used in many motalworking plants on production work. Has two 38-inch disks. Equipped with one plain table, and one slotted for circle, sogment, duplicating gauges for grinding circular, angular, compound shapes, Self-contained hoist handles disks. Table tilts 45° up. 10° down.

Write for Bulletin 34-DD

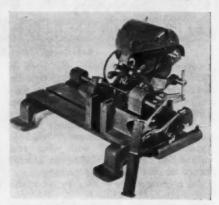
OLIVER MACHINERY COMPANY GRAND RAPIDS 2, MICH.

Encircle No. 477 on Card, Opposite Page 65

Centering machine

The Central centering machine centers and drills or spot faces and pin points the ends of small cylindrical workpieces—for example, small electric motor shafts.

It is possible to completely finish the external diameter of the workpiece



before centering or drilling the ends. By rotating the workpiece and maintaining the tool stationary, concentricity can be held to .0003", distortion of ends eliminated, and breakage of the tools reduced, the manufacturer claims.

The workpiece is placed on a pair of supporting rollers which are adjustable so as to accommodate workpieces up to 1" dia. and any length. A single lever locks the workpiece in operating position, feeding the tool into the piece and supplying a predetermined amount of lubricant. Speeds are as high as 15,000 rpm. Central Engineering Co., Dept. RB, 930 Erie St., Racine, Wis.

Slide feed for stock up to 18"

An air operated slide feed in five sizes with lengths of feed up to 36" has open throat design which enables feeding of stock up to 18" in width. Units can be timed from the press



crankshaft or ram, or they may also be installed to operate the press. They may be mounted so the press can be tripped on any predetermined number of feed lengths, making available long lengths from a short feed.

These feeds will operate on either side, front or back of press or may be used on special applications. Long feed lengths can be fed on small presses. Cooper Weymouth, Inc., Dept. MTB, 277 Noble Ave., Bridgeport 8, Conn.

Use ACTION Card, oppssite page 64. Encircle No. 52

Thin gage blocks

Webber "Thin Blocks" gages range in thickness from .090" to .010", with accuracies of ± .000004" and ± .000008". They are made of steel, and are designed to withstand daily production use, the manufacturer states. The new gage blocks are available either individually or in sets of 30. Webber Gage Co., Dept. RH, 12912 Triskett Rd., Cleveland 11, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 53





Encircle No. 479 on Card, Opposite Page 65

Packaged hydraulic systems

Rosaen standard hydraulic power units are available in five sizes, from ³4 to 20 horsepower.

Electric motors, pumps, and the neces-



sary valves are mounted on TK tanks which already are equipped with the basic accessories (fittings, pipes, filler cap, etc.). Power units are made as compact as possible. The Rosaen Co., Dept. JS, 24601 Harper Ave., St. Clair Shores, Mich.

Use ACTION Card, opposite page 64. Encircle No. 54

Tool control unit

A tool control unit for screw machines, drill presses, gear hobbers, punch presses, gear shavers and milling machines is available in four different sizes with one, two, four or eight Toolometers which automatically shut down the machine when tools need changing.

The pointer on the Toolometer is set at a point representing the expected output of pieces per tool sharpening. It indexes counter-clockwise with each



machine cycle. When it reaches zero, the machine automatically shuts down for a tool change. The Cross Co., Dept. 17P, Detroit 7, Mich.

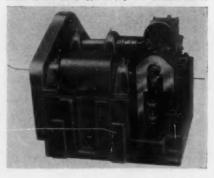
Use ACTION Card, opposite page 64. Encircle No. 55

Wire straightening and cutoff machine

Electrically controlled clutch and target feature the redesigned Model 3A Shuster wire straightening and cutoff machine, manufactured by Mettler Machine Tool, Inc., Dept. BTM, New Haven, Conn.

Operation of the machine may be controlled from one point. Other features include instantaneous clutch and cutoff cam; lightning cutoff knife; V-belt motor drive; gear driven feed rolls and lower breaking rolls; and 5-die straightening flier.

Use ACTION Card, opposite page 64. Encircle No. 56



MACHINE and TOOL BLUE BOOK

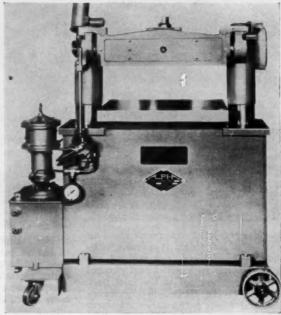
Air or Hydraulic Die Tryout Press

A new die tryout press of 50 or 75 ton capacity operated either airdraulically or hydraulically, is now available from Alpha Tool Works, Dept. JS, 9281 Freeland Ave., Detroit 28, Mich.

The head can be released and rotated to any point up to 240°. The base houses two hydraulic cylinders. The 50 ton press occupies 28" x 56" of floor space. Over-all height with stroke down, 64".

The 75 ton press occupies 30" x 60" of floor space. Over-all height with stroke down, 66". Tonnage of the airdraulically operated press is based upon 80 pounds air pressure. Both models are mobile.

Both die members may be barbered, sheared, fitted and



finished without removal from press.
Use ACTION Card, epposite page 64. Encircle No. 57

Pressure regulators and relief valve for aircraft

Three new products for aircraft—an absolute pressure regulator, a pressure regulator and a pressure relief valve—have been announced by The Aro Equipment Corp., Dept. JS, Bryan, O.

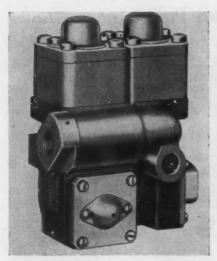
The absolute pressure regulator, model 12275, is used for controlling the absolute pressure in electronic equipment containers and for other aircraft applications where absolute pressure must be maintained within close limits. Engine-bleed air or other dry gases are used for its operation. The regulator operates at inlet pressure from 35 to 250 psia, with a flow of up to 10 liters per minute. It will maintain 15 to 19 psia, and will sustain 13 G's applied

in any direction. Regulator can be calibrated to meet different specific applications. Where necessary, it can be adapted to inlet pressures of up to 1800 psig.

Air Pressure Regulator Model 13200



Encircle No. 480 on Card, Opposite Page 65



provides regulated compressor bleed air to external fuel tanks. It operates without overboard bleed, and without external leakage with outlet port plugged and 200 psig applied at the inlet port. Sustains 11 G's applied in any direction, and meets performance standards with one G applied in any direction.

Pressure Relief Valve Model 13300 is used for maintaining external fuel tank pressure within required limits. It passes no more than .5 cfm standard air at pressure differential of 7.5 psi, and not less than 15 cfm standard air at pressure differential of 8.5 psi.

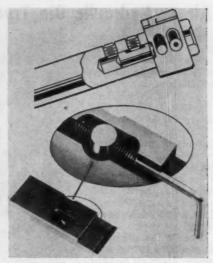
Use ACTION Card, opposite page 64. Encircle No. 58

Boring and reaming cutters have protected adjustment

Fully protected cutter adjustment on Maxwell boring and reaming cutters is claimed to make possible improved cutter performance and increased tool life.

As shown in the illustration, the micrometer adjusting screw is protected against wear and gall from chips. It permits adjustment in both directions to increase or decrease cutter diameter.

Tools also feature selective float con-



trol for reaming operations. Cutter floats in bar at point of cutting action, and float can be adjusted between bar and cutter to compensate for misalignment of equipment. In boring operations, cutter is locked in bar to hold concentricity.

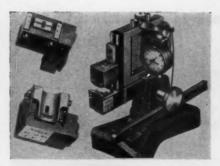
Dull cutters are changed in seconds without changing the job setup, as only the cutter is removed for sharpening. Cutters are adjusted to size, instead of ground to size. Only 16 cutters are required for bores between 1" and 2" in diameter. Maxwell Co., Dept. RH, 386 Broadway, Bedford, O.

Use ACTION Card, epposite page 64. Encircle No. 59

Pitch diameter gage

An instrument for the measurement of pitch diameter of threads has been announced by Standard Gage Co., Inc., Dept. RS, Poughkeepsie, N.Y.

Measurement of pitch diameter is basically by the three-wire method, but with holder devices of such design that the operator of the gage need not be aware of the wires themselves. Upper wire is approximately positioned by two plungers, which automatically re-



cede under the effect of the gaging action. Lower wires are separated slightly by collars but limited as to maximum spacing. Wires are of tungsten carbide for most pitches.

Measuring pressure is adjustable but constant for a particular setting. Therefore the pressure is the same on the workpiece as on the master and is independent of judgment.

Six sets of interchangeable jaws cover a range from 56 to 10 threads per inch and diameters up to one inch. Gage is regularly furnished with a dial indicator graduated in .0001". Indicator may be faced in direction desired.

Use ACTION Card, opposite page 64. Encircle No. 60

Machine broaches ten internal splines in one pass

The American 30 ton, 60" stroke pull-down broaching machine automatically broaches ten internal splines in an automotive brake drum in one pass.

A hydraulically operated loading mechanism with an internal chucking device picks up the part off the conveyor line and transfers it across to the sliding work-holding fixture. The collet type fixture automatically clamps the part and moves it into broaching position. The broach is pulled down through the part, broaching ten 1" wide splines in the workpiece. At the end of the broaching stroke the slide moves

out, automatically ejecting the part back on to the belt conveyor. The broach returns to starting position. During the broaching and return stroke the loading unit moves across on guide rails, picks up another part from the conveyor line and returns ready to reload the work fixture.

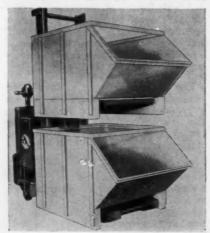
American Broach & Machine Co., Dept. JS, 415 W. Huron St., Ann Arbor, Mich.

Use ACTION Card, opposite page 64. Encircle No. 61

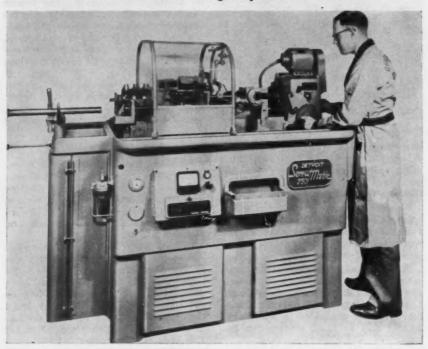
King-size palletized stackbins

Primarily useful as carrier for heavy small parts or irregularly shaped materials, Stackbin king-size palletized stackbins are constructed of all welded, heavily reinforced sheet steel. Underclearance fits all types of fork and platform trucks.

Hopper front keeps contents visible and easily accessible for inventory and further processing purposes. Bin illustrated has the capacity of four large drums and is 36" wide by 24" deep by 48" long, including 12" hopper front. Can be custom-made to the specifications of user. Stackbin Corp., Dept. JP, 1257 Main St., Pawtucket, R.I.



Unit-Construction featured in single spindle automatic



A new feature of the recently introduced Detroit Screwmatic 750 single spindle automatic is "unit-construction," said to offer a solution to the obsolescence of screw machines and decrease capital expenditure for new equipment.

Ten individual units comprise the Screwmatic 750. When innovations are introduced, they will be designed into the separate units. The user need only change that unit to have the latest in screw machines.

The ten individual units are: (1) spindle housing, chucking and trip lever assembly, (2) main spindle unit, (3) vertical slide attachment, (4) spindle drive gear box, (5) machine base, (6) front and rear cross slides, (7) six posi-

tion turret, (8) Adjusto Speed Drive motor, (9) camshaft and indexing drive unit, (10) turret slide assembly.

Use ACTION Card, opposite page 64. Encircle No. 63

Portable band saw cuts problem materials

A high-speed steel blade for a portable electric band saw makes it possible to cut most tough metal materials such as stainless steel, carbon tool steel, nickel, and high speed tool steel. Introduced by Porter-Cable Machine Co., Dept. RS, 59 Exchange St., Syracuse, N.Y., and specifically designed for use with the Model 524



Porta-Band Saw. It is scarcely larger than a hand hack saw.

The ½ hp motor turns over 94 times for every revolution of the drive pulley. The band speed is 240 surface feet per minute under load which is midway between the ideal speed for cutting ferrous and nonferrous materials. The design of the saw enables it to cut rectangular stock up to 31/4"x41/4", or round stock up to 31/4" in diameter. This capacity is equal to that of a large hand hack saw. Conventional blades are available in a range of 6 to 32 teeth per inch for most types of cutting. The high-speed blade for tough materials is available in 6, 9, 12 and 16 teeth per inch sizes.

Use ACTION Card, apposite page 64, Encircle No. 64

Brinell hardness tester flashes colored lights

The Color-Glance Brinell hardness tester decides which pieces are of proper hardness and indicates too hard, within range, or too soft through the use of colored lights. Performance—up to 800 tests per hour.

Machine is designed for minimum maintenance and simple operation. It is adaptable to most Brinell testing jobs. The cycle is semi-automatic, being



started by the operator momentarily depressing the knee switch. Once the cycle is started, the machine automatically applies the full Brinell load, indicates the relative hardness, then retracts the ball penetrator, ready for the next test. Operator manually unloads and loads the work. Parts varying as much as ½" in thickness can be tested without readjusting elevating screw.

Use ACTION Card, opposite page 64. Encircle No. 65

Throw-away insert tool holder

The Universatool, Viking Tool Co., Dept. MG, Shelton, Conn., has been developed to perform lead angle facing, lead angle turning—in both directions, grooving, chamfering—both sides, and combination plunging-turning operations.

The square throw-away carbide insert provides four sides with the positive rake holder. Included in the holder design is an adjustable chipbreaker, replaceable carbide anvil, positive insert location, and indexability within ±.002".

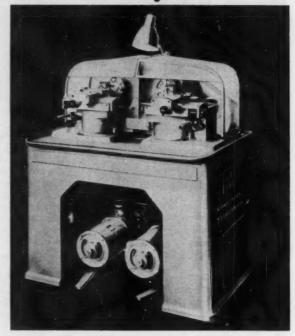


Semiautomatic Lathe Has Dual Head Arrangement

The Swiss-built Kummer Type MR 6020 semiautomatic lathe has dual-head arrangement, which is claimed to permit turning of intricate forms and faster machining time on production runs.

The operator loads the workpiece into the chuck actuated by a pedal and engages the slide motion and spindle drive by depressing the starting handle. The head automatically stops at the end of each cycle. During the operation of the first head the operator changes the workpiece in the stopped second head. Carl Hirschmann Co., Inc., Dept. MG, 30 Park Ave., Manhasset, N.Y.

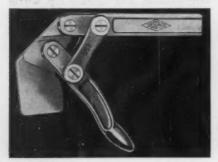


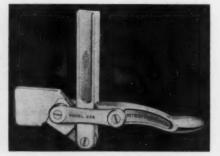


Toggle Clamps Have Holding Pressures to 4000 Lb.

Two heavy-duty De-Sta-Co Titan toggle clamps, featuring replaceable parts, forged alloy-steel components, holding pressures up to 4000 lb. and weighing 4½ lb., can be used for rugged

production jobs requiring positive viselike holding pressures. Every part can be replaced simply by the use of a screw driver. Threaded pivot rods and serrated bushings are used throughout.





320

MACHINE and TOOL BLUE BOOK

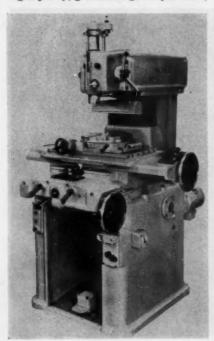
Pivot rods are hardened and ground. Serrated bushings are also hardened. All forgings are of alloy steel.

Model 557 is recommended whenever overhead clearance is limited. It features the low-silhouette both in the open and closed positions, accomplished by the flop-over movement. For production jobs where clearance allows for use of an upright handle, Model 558 is recommended. Detroit Stamping Co., Dept. JS, 347 Midland Ave., Detroit 3, Mich.

Use ACTION Card, opposite page 64. Encircle No. 68

Jig borer has increased capacity

While retaining the sensitivity of the Hauser 2BA jig borer, the 3BA incorporates these new features: greater boring capacity, greater height adjustment,



heavier quill, larger table surface and greater table travel.

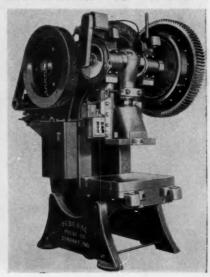
Working surface of table is 21¾" x 12¾"; longitudinal table travel, 15¾"; travel of transverse slide, 10"; max. distance boring spindle to table, 23½"; adjustment of vertical slide, 15"; vertical travel of boring spindle, 5½". Carl Hirschmann Co., Inc., Dept. MG, 30 Park Ave., Manhasset, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 69

100-ton press has air-actuated clutch

The Federal No. 8 air clutch press, a 100-ton unit, is reported to permit precision operation at high speeds with maximum safety.

It is equipped with an air-actuated clutch and is electro-pneumatically controlled. Twin solenoid valves provide utmost safety. A system of lights on the control panel signals the operator that the press is in safe operating condition. Federal Press Co., Dept. JS, Elkhart, Indiana.



December, 1955

Multi-wheelslide cylindrical grinder plunge grinds multiple diameters simultaneously

The CMS-1 semiautomatic multiwheelslide cylindrical grinding machine can be adapted to a wide range of cylindrical grinding operations. The principle advantage of the machine is its ability to plunge grind multiple diameters simultaneously on workpieces which, because of their shape, do not lend themselves to grinding on conventional multi-wheel machines. Savings in both setup and grinding time are claimed substantial.

Sturdy, unitized wheel slides are positioned during manufacture for the requirements of a specific job. The wheelslides may be opposed or placed in line, whichever is better suited. Provision is made for slight angular or lateral adjustment of position for setup purposes. The slides are self-contained with respect to motion and truing but operate in unison during production. Centrally located one-lever control of the automatic grinding cycle and automatic termination of the cycle under electrically timed control, simplify operation.

Each wheelslide mounts one or more 30" diameter grinding wheels. The type of work holding equipment furnished

depends on the job.

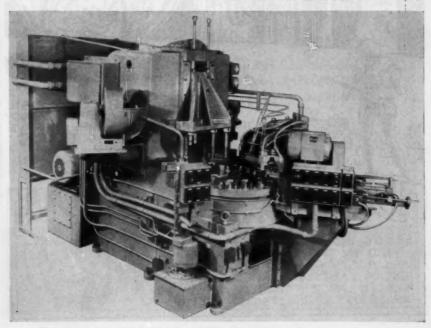
Two-rate automatic feed; wheel feed hand wheels with "click-count" indexing mechanisms permit feed adjustments in increments of tenths without visual attention, simplify size control in setup and initial operation. Norton Co., Worcester 6, Mass.



Vertical Hydraulic Machine Assembles, Burnishes, Drills

This vertical hydraulic machine with automatic cycle assembles bushings into the wrist pin hole of an automotive connecting rod, burnishes the bushing, center drills one wall of the wrist pin bore and then drills an oil hole through. The unit was developed and built around a 3-way type machine column, arranged with a six-station index table. Mounted on the table are six, 2-station fixtures which hold two parts each. The operator loads and unloads parts at the front as the fixtures index past the station. The assembly, burnishing and two drilling units are arranged around the periphery of the indexing table.

At the assembly station a hopper feeds the split bushings to a slide which automatically moves the bushings into position for assembly. Following assembly of the bushing to the wrist pin bore. the parts are indexed to the burnishing station. HSS burnishing tools are pushed through, burnishing the id of the bushings. A stripper plate allows the burnishers to return, after which the parts index to the first drilling station. Here one wall of the wrist pin bore is spot-drilled. At the last work station the oil hole is drilled through the wall and the parts are then indexed to the unloading and loading station. Both drilling stations are equipped with 2-station self-contained drilling units and separate electric motors. Manufacturer is the American Broach & Machine Co., Dept. MTB, 415 W. Huron St., Ann Arbor, Mich.

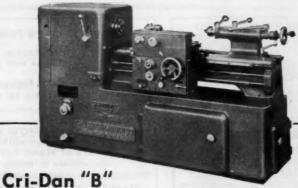


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column face. Support is by the arbor and overarm. It is driven from the machine through helical bevel gears, with drive shaft mounted in Timken roller bearings. Greaves Machine Tool Div., J. A. Fay and Egan Co., Dept. HS, 2011 Eastern Ave., Cincinnati 2, O.

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4 4 5 5 5 5 5 5	i - 1/8 i - 1/4 1/4 5/16 3/8 7/16 9/16	1-1/4 1-1/4 1 1	25.75 28.35 17.50 17.80 19.70 20.95 23.55 26.30
5 5 8 6 8 6	13/16 7/8 15/16 1/4 5/16 3/8 7/16 9/16	1-1/4	28.35 30.50 31.50 21.60 22.10 23.70 25.30 31.20
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10 10 10 10 10 10 10 12 12 12 12	3/8 1/2 5/8 3/4 7/8 1 1/2 5/8 3/4 7/8	1-1/2 1-1/2 1-1/2 1-1/2 1-1/2 1-1/2 1-1/2 1-1/2 1-1/2 1-1/2	83.75 92.30 105.35 121.50 131.95 136.70 153.95 169.75 174.35 220.10

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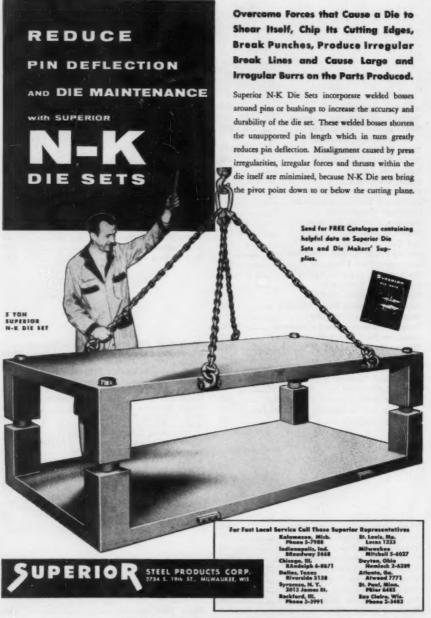
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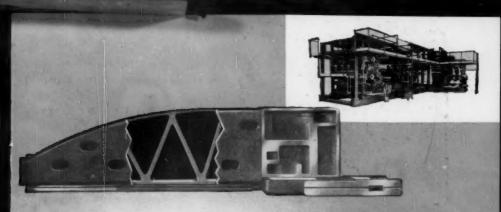
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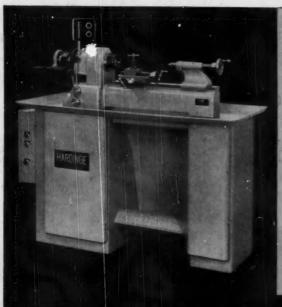
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